P-40E WARHAWK VS A6M2 ZERO-SEN

East Indies and Darwin 1942

PETER INGMAN

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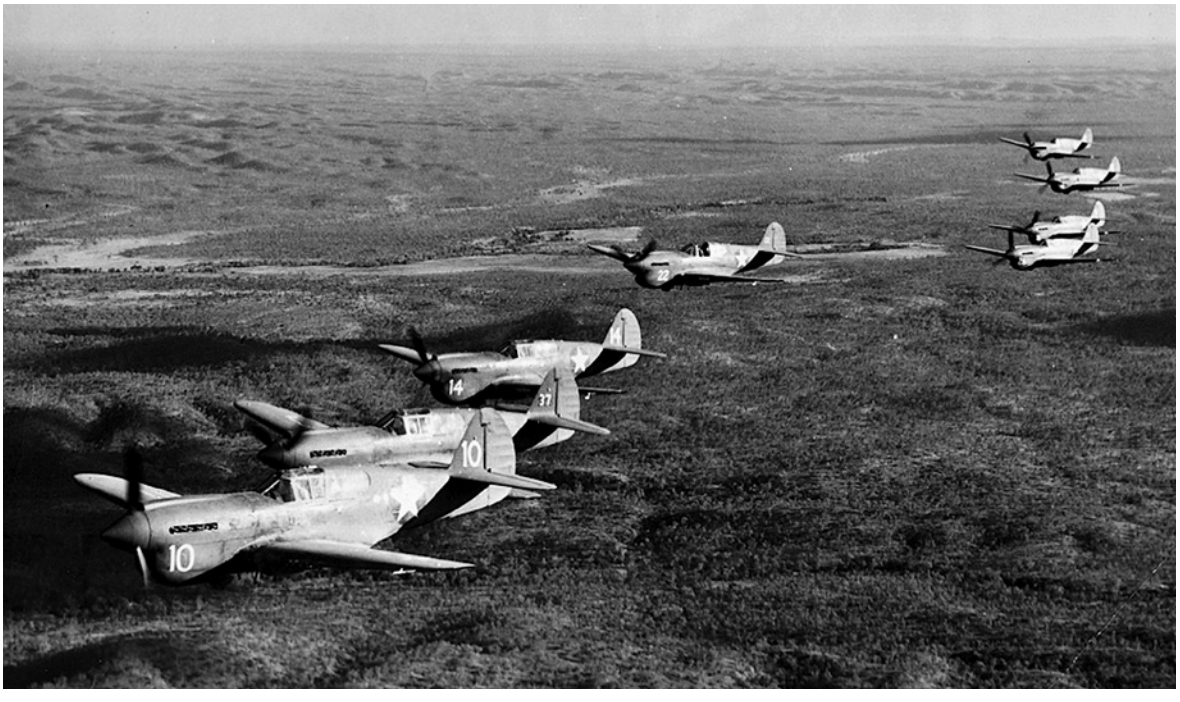
INTRODUCTION

The Curtiss P-40E Warhawk and the Mitsubishi A6M2 Zero were two classic World War II fighter types. Both were in service at the start of the Pacific War, and they saw extensive use during the first 12 months of that conflict. The P-40E saw widespread employment beyond the Pacific too, serving in just about every theater during the course of the war.

While the Zero-sen is remembered as being a first-class fighting machine that swept all before it, the P-40E never achieved the same status. Indeed, some military historians are apt to include the American fighter in a "basket" of early war "obsolete" fighter types and, in such a generalist way, use this as an explanation as to why the Zero-sen achieved such stunning victories over the Curtiss "pursuit" in the early months of the campaign. However, such reasoning is both simplistic and disingenuous. The P-40E was a modern fighter at the start of the Pacific War, and it shared the same performance envelope as the A6M2. Indeed, it was a full generation beyond 1930s' fighter types such as the Hawk 75, from which it was derived.

To fully understand how both the P-40E and the Zero-sen compared requires a full survey of a wide variety of qualitative factors. This is best undertaken within a study of the 1942 air campaign fought over the East Indies and Darwin. Warhawks were rushed to Java, in the Netherlands East Indies (NEI), from the USA (via Australia), where they conducted a last-ditch defense of the island alongside a miscellany of Dutch and British types. While this campaign was short-lived, many of the American pilots made full use of their experience in the subsequent defense of Darwin in 1942, where 49th Fighter Group (FG) P-40Es engaged A6M2s of the 3rd Kokutai as the latter escorted Imperial Japanese Naval Air Force (IJNAF) bombers. These types repeatedly met in large numbers, with several mass engagements taking place that involved as many as 50 to 80 aircraft from both sides.



Two four-aircraft flights of P-40Es from the 7th PS fly over typical northern Australian terrain in April 1942. This unit was the first of the 49th PG's trio of squadrons to see action during a brief deployment to Horn Island in March 1942. By the following month it had rejoined the remainder of the group at airfields just south of Darwin. (Michael Claringbould)

Elsewhere, Zero-sens came up against P-40B/Cs during the Pearl Harbor attack and both P-40B and Es in the Philippines. In New Guinea, Royal Australian Air Force (RAAF) P-40Es – christened Kittyhawk IAs in Australian service – also saw intense combat against A6M2s, especially in March 1942 when No. 75 Sqn was the sole Allied fighter unit in-theater. Later that year the 49th FG moved to New Guinea with its P-40Es, and some of these aircraft remained in frontline service into the first half of 1943. Further afield, E-model Warhawks of the USAAF's Eleventh Air Force briefly fought against carrier-based Zero-sens in the Aleutians. Details of these campaigns can be found in *Osprey Aircraft of the Aces 38 – Tomahawk and Kittyhawk Aces of the RAF and Commonwealth* by Andrew Thomas, *Osprey Aircraft of the Aces 55 – P-40 Warhawk Aces of the Pacific* by Carl Molesworth and *Osprey Aviation Elite Units – 49th Fighter Group* by William N Hess.

Both the USAAF and the Republic of China Air Force operated P-40Es in China during 1942–43 before they were replaced by more modern Warhawk variants (which served in the frontline through to war's end) and newer types such as the P-51 Mustang. None of these P-40Es likely experienced combat with Zero-sens, however, as the Imperial Japanese Army Air Force (as opposed to the IJNAF, which was, of course, the sole operator of the A6M) had responsibility for aerial operations in China after December 1941. The campaign fought by later model Warhawks in China-Burma-India is detailed in *Osprey Aircraft of the Aces 35 – P-40 Warhawk Aces of the CBI* and *Osprey Duel 8 – P-40 Warhawk vs Ki-43* Oscar, both by Carl Molesworth.

So, except for the March 1942 combat between RAAF Kittyhawk IAs and Zero-sens over New Guinea, the East Indies and Darwin campaign in that same year are the best examples of sustained combat between the P-40E and the A6M.

Additionally, because of geographic isolation from other theaters, the Darwin campaign saw the two types engage in repeated combat without interference from other fighter types.

Initially, the Japanese sought to extinguish Allied air power on Java using counter-air tactics by means of fighter sweeps aimed at destroying Allied aircraft on the ground. Then the IJNAF switched to a conventional bombing campaign against both Java and Darwin, sending formations of G4M "Betty" bombers, escorted by Zero-sens, to attack targets from medium to high altitudes. It was a tough ask for the P-40E to thwart these raids, as it had not been designed as an interceptor and performed poorly at altitudes in excess of 15,000ft. It would need every ounce of American ingenuity and resourcefulness to get the best out of the E-model Warhawk in these circumstances.

JAPANESE TERMINOLOGY

The following Japanese unit terminology should be applied as a broad guide only, for there are no exact Western equivalents. Confusion often arises with these terms because the IJNAF used a complicated parallel organizational structure, with terminology to match. Indeed, some terms refer to personnel within an administrative framework, which was firmly established, and others reflect tactical and operational aircraft formations. To confuse matters further, some terms cover both aspects.

Kokutai – an IJNAF air group, consisting of between three to six chutai

Hikotaicho – commander of a kokutai

Chutai – a sub-unit of nine aircraft

Chutaicho – leader of a chutai

Buntai – equivalent to a chutai but usually accompanied by administrative or established command status

Buntaicho – leader of a buntai

Shotai – a tactical formation typically of three aircraft (although sometimes two or four aircraft)

Shotaicho – leader of a shotai

JAPANESE RANK ABBREVIATIONS

FPO1c	Flying Petty Officer First Class
FPO2c	Flying Petty Officer Second Class
FPO3c	Flying Petty Officer Third Class
NAP1c	Naval Air Pilot First Class
SEA1c	Seaman First Class

CHRONOLOGY

1938

October 14 First flight of the Curtiss XP-40.

1939

April 1 First flight of the Mitsubishi 12-Shi Carrier Fighter (later designated A6M).

1940

September 13 Combat debut of the Zero-sen in China by the 12th Kokutai.

1941

January The 49th Pursuit Group (PG) activated at Selfridge Field, Michigan.

September Re-formation of the 3rd Kokutai as an A6M2-equipped fighter unit in Formosa. Many of its pilots are 12th Kokutai combat veterans from China.

December 8 and 10 The 3rd Kokutai participates in long-range missions to Luzon, in the Philippines, resulting in combat with USAAC P-35 and P-40 fighters. During this period of intense action the Japanese are victorious and American air power in the Philippines is crippled.

December 23 The first 18 P-40Es destined for the 17th PS (Prov) arrive in Australia on board a vessel within the Pensacola Convoy, which had been diverted from its original destination of the Philippines.

1942

January 13 Fifty-five P-40Es and their pilots arrive in Australia on board the SS *President Polk*. Further deliveries soon follow. Plans are quickly drawn up by the USAAC to issue aircraft to five "provisional" pursuit squadrons that are to be formed in Australia. Intended for service in the Philippines, these were instead sent to Java, in the NEI.

January 24 First flight of 17th PS (Prov) P-40Es arrives in Java. Many of the pilots are veterans of the ill-fated campaign in the Philippines.

January 25 The 3rd Kokutai moves into the newly captured airfield at Kendari, in the Celebes, which would become its primary base for much of 1942–43.

February 1 The 17th PS (Prov) arrives at the camouflaged airfield of Ngoro, in eastern Java.

February 2 The 49th PG disembarks in Melbourne, Victoria, after a month-long sea voyage from the USA.

February 3 Both the 17th PS (Prov) and the 3rd Kokutai are in action during a large aerial battle over Java.

February 5 The 3rd Kokutai Zero-sens maul the newly arrived 20th PS (Prov) while on the ground refueling in Bali. Remnants of the squadron are merged into the 17th PS (Prov).

February 9 Eight 3rd PS (Prov) P-40Es are lost in bad weather during the ferry flight from Darwin to Timor. Remnants of this squadron are also merged into the 17th PS (Prov).A massive raid on Darwin by aircraft from four IJN carriers. Nine P-40Es of the 33rd PS (Prov) are destroyed.

February 20 17th PS (Prov) commanding officer Capt Charles Sprague is killed in action over Bali and five P-40Es are lost. Squadron morale plummets.

Capt Gaifu Kamei, commanding officer of the 3rd Kokutai, leads his men in a *Tennoheika Banzai* ("Long live His Majesty the Emperor") battle cry at Kendari prior to the unit participating in a raid on eastern Java on February 11, 1942. (Yasuho Izawa)

February 27 The carrier USS *Langley* (CV-1), loaded with 32 P-40Es and associated pilots and groundcrew, is mortally damaged by IJNAF G4M "Betty" bombers south of Tjilatjap, Java. The vessel is finished off by its escorting destroyers.

March 1 The destroyer USS *Edsall* (DD-219) is sunk by IJN vessels, taking with it 31 pilots from the 13th and 33rd PS (Prov) rescued from *Langley*. The loss of CV-1 and DD-219 effectively eliminates these USAAC units. That same day, the 17th PS (Prov) flies its final mission against the eastern Java invasion force. The unit is then disbanded and its personnel evacuated to Australia.

March 3 A single chutai of 3rd Kokutai A6M2s mount a devastating ultra-long-range raid on Broome, Western Australia.

March 8 Surrender of the NEI. The 3rd Kokutai A6M2s can now focus on flying missions over northern Australia from Penfui airfield, Timor.

March The 9th PS/49th PG arrives in Darwin and meets the 3rd Kokutai in combat for the first time at the end of the month.

April All three squadrons of the 49th PG arrive in Darwin and enjoy success against IJNAF bombers flying at medium altitude with only a modest escort provided by the 3rd Kokutai. Several G4Ms are shot down. However, in the final raid of the month on the 27th the Zero-sen escort is enlarged and the CO of the 8th PS, Capt Allison Strauss, is killed.

June The IJNAF launches a multi-day blitz on Darwin that represents the peak of the campaign. Several large-scale aerial engagements occur, with as many as 45 Zero-sens battling a similar number of P-40Es.

July Several night raids, with just one large-scale daylight raid at the end of the month.

August 23 A maximum strength daylight raid targets Hughes airfield south of Darwin on 23 August. In the best result yet for the 49th FG against the 3rd Kokutai, its pilots down four Zero-sens.

September End of the campaign between the 3rd Kokutai and the 49th FG. RAAF P-40E squadrons take over the defense of Darwin, allowing the 49th FG to redeploy to New Guinea. That same month a detachment of Zero-sens from the 3rd Kokutai is sent to Rabaul to support operations over Guadalcanal.

DESIGN AND DEVELOPMENT

The Curtiss-Wright Corporation had a rich history of fighter design through the Hawk series of biplanes of the 1920s and early 1930s. However, the P-36 Hawk all-metal monoplane fighter, which first flew on May 6, 1935, had relatively little in common with these earlier aircraft. It was the brainchild of designer Donovan Berlin, who had been recruited to Curtiss from Northrop. Despite various teething problems with its original 900hp Wright XR-1670-5 radial engine (which was quickly replaced by a 950hp Wright XR-1820-39 Cyclone of an identical configuration), the highly maneuverable P-36 represented a generational advance for the USAAC at the time.

Eventually fitted with a 900hp Pratt & Whitney R-1830-13 Twin Wasp radial, the resulting P-36A won the 1937 USAAC fighter competition and Curtiss received an order for 210 examples. Introduced into frontline service from 1938, the aircraft was underpowered, resulting in it having a top speed of barely 300mph.

In early 1937 Curtiss was ordered by the USAAC to fit a new 1,040hp liquid-cooled turbo-supercharged Allison V-1710 engine into a heavily modified P-36 airframe. The resulting YP-37 promised a top speed of 340mph, but development of the aircraft ended when the similar, but simpler, Berlin-designed Model 75P was selected instead. Given the designation XP-40 by the USAAC, it first flew on October 14, 1938. The prototype had its glycol coolant radiator in an underbelly position, although this was eventually moved forward to the chin following NACA wind tunnel evaluation as Curtiss engineers worked to make the aircraft faster through improved aerodynamics. This would result in the distinctive P-40 appearance synonymous with

P-40E WARHAWK

the Warhawk family. Thanks to these improvements, and many hours in the wind tunnel, the XP-40 achieved a top speed of 342mph at 12,000ft. This was deemed to be good enough for the USAAC to order 524 P-40s in April 1939. It was the largest such production order for an American fighter during the interwar period.

It should be noted that Curtiss received this contract at a time when American military doctrine mainly concerned with the continental defense of the USA itself. It was expected that future USAAC single-engined fighters would need to conduct coastal defensive patrols at medium to low altitudes from nearby airfields. Rugged types that could also perform close-support missions for ground forces were preferred, and there was no perceived need for such fighters to intercept enemy aircraft approaching at high altitude. In fact, the latter mission was seen as a role for an entirely different type of fighter, and to this end the twin-engined Lockheed P-38 Lightning was being developed at the same time as the P-40.

In various respects the production order for the Curtiss fighter was a conservative choice, and reflected the fact that design risk was minimized as the new aircraft had much in common with the existing P-36. The USAAC wanted a design that could enter production quickly and, ultimately, this view was vindicated. The P-40 would be available to fight when other more promising aircraft were still overcoming various technical challenges. As previously noted, the new fighter was powered by a 1,040hp Allison V-1710-33 engine, which proved reliable. However, its single-stage supercharger could not generate power above medium altitudes.

Ultimately, only 200 of the first 500 P-40s built were delivered to the USAAC. Due to the war in Europe, the remainder were diverted to a French order as Hawk 81A-1s (ostensibly the same as the USAAC's P-40Bs). These aircraft were in turn taken over by the British after the fall of France in June 1940, the fighters being given the designation Tomahawk I.

By 1941 USAAC production had switched from the B- to the C-model P-40, the latter boasting a mix of 0.30- and 0.50-cal machine guns, self-sealing fuel tanks and a 52-gallon drop tank. Two 0.50-cal weapons were mounted in the nose cowling above

OPPOSITE

A number of the P-40Es issued to the 49th PG in early 1942 were painted in DuPont DUCO dark earth and dark green, with neutral gray undersides, as these were "reverse" Lend-Lease aircraft issued to the USAAC rather than their original customer, the RAF. As seen with this aircraft, some even featured their RAF serial number (here obscured by a white flight leader's stripe) on the rear fuselage. During the course of the 1942 air campaign, the 49th's Warhawks grew progressively more colorful, with many being adorned with lavish decorative artwork on their fuselages and noses. This particular example (probably ET600), flown by ace 2Lt Andy Reynolds, was nicknamed "*STAR DUST*" and marked up with a swooping eagle (or hawk) with bloody talons – this motif appeared on multiple aircraft, and may have for a time been a de facto unit insignia for the 9th PS/FS. For whatever reason this logo did not last, and the unit eventually became known as the "Flying Knights."

Posing in front of a recently arrived P-40E that they had been charged with guarding, these smiling Australian Army soldiers lend a sense of scale to the large Allison V-1710 liquid-cooled engine that powered the Warhawk. The engine produced a considerable amount of propeller torque that routinely caught out novice pilots on take-off. Also clearly visible is the widely spaced undercarriage, which gave the fighter good rough field performance. (Australian War Memorial)

A6M2 ZERO-SEN MODEL 21

the engine (a legacy of the P-36) and two or four 0.30-cal machine guns installed in the wings. The subsequent P-40D introduced further variations, including an improved 1,150hp Allison V-1710-39 engine, shortened nose, deeper radiator/oil cooler chin scoop and additional armor. The fuselage guns were removed to accommodate the larger engine, so all weaponry (four 0.50-cals) were now in the wings. This variant was ordered by the RAF under the designation Kittyhawk I.

Just 22 of P-40Ds had been built when USAAC production switched to the E-model, which became the first version to be produced in large numbers after the attack on Pearl Harbor on December 7, 1941. Some 820 were built for American contracts, plus 2,060 for the RAF as Kittyhawk I/IAs. Armament was increased to three 0.50-cals in each wing, and the aircraft could now also carry one 500lb bomb under the center fuselage or two 100lb weapons under the wings. Top speed was 362mph at 15,000ft, with maximum altitude limited to 29,000ft.

The various improvements to the aircraft's warfighting capabilities had seen its fully loaded weight rise from 6,870lbs in the XP-40 to 9,200lbs in the P-40E – an increase of 33 percent! The P-40 as ordered in 1939 had a quoted climb rate of 3,080ft per minute. With the weight increases, this had fallen to a sluggish 2,100ft per minute in the P-40E. One advantage of this weight was that the E-model could attain high speeds in a dive. This attribute would prove very useful in 1941–42 when P-40 pilots found themselves urgently needing to terminate combat with lighter adversaries such as the Zero-sen.

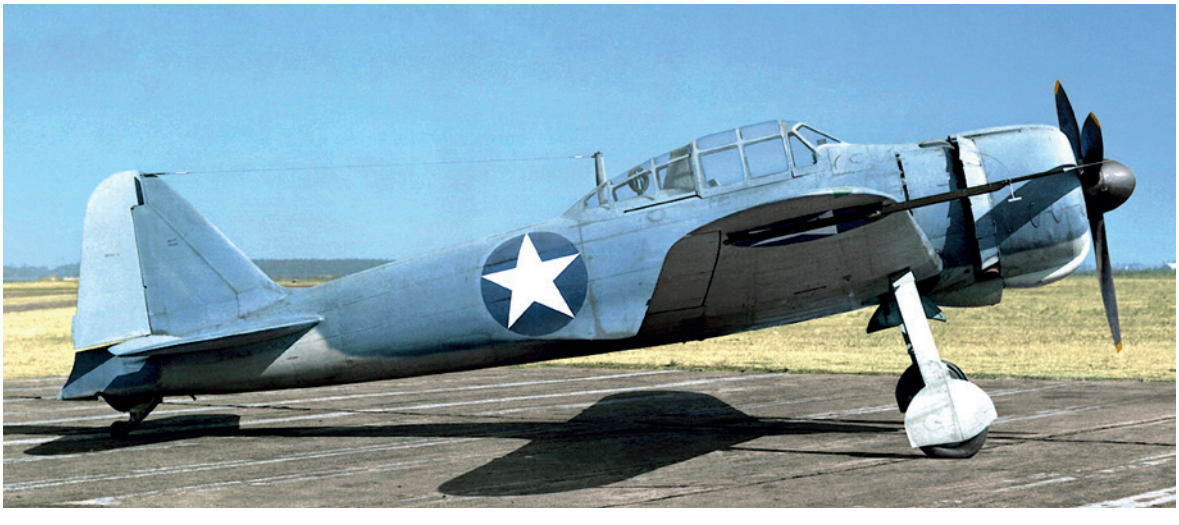
The design history of the Zero-sen mirrored the P-40 in respect to timing. In early 1937 the Mitsubishi A5M (given the Allied reporting name "Claude" in World War II) became the first carrier-based monoplane fighter to enter frontline service – almost 1,100 examples were subsequently built. The A5M would have a similar impact on the IJNAF as the P-36 had on the USAAC.

On October 5, 1937, just months after the A5M had started to reach fleet units, the IJNAF issued "Planning Requirements for the Prototype 12-shi Carrier-Based Fighter" to both Mitsubishi and Nakajima as a successor to the new aircraft was sought. Combat reports filtering back to Japan from the vast China theater, where the

OPPOSITE

A6M2 Zero-sens of the 3rd Kokutai wore the IJNAF's standard gray-green scheme overall, with black cowlings and "X"-prefixed serial numbers on their tails. Combinations of fuselage and tail stripes were used to identify particular chutai, their sub-formations of shotai and individual leaders of each. These visual identifiers were important, for the Zero-sen pilots flew together for long periods without radios, prior to assuming their tactical formations on approach the target area. This particular Zero-sen was regularly flown by future ace FP03c Kunimori Nakakariya during operations over the NEI and northern Australia in early 1942.

Looking like an American naval fighter after being repainted in the standard US Navy colors of the day, the "Akutan Zero" sits on the ramp at the Langley Research Center, Virginia, on March 8, 1943. The first Japanese combat aircraft to be test flown in the USA, the A6M2 had been recovered from its crash site in a marshy field on deserted Akutan Island, in the Aleutians, in July 1942. (Tony Holmes Collection)



Wreckage of A6M2 BII-124 from the carrier *Hiryu* on display in the Darwin Aviation Museum. This aircraft crash-landed on Melville Island after being damaged by ground fire during the raid on Darwin on February 19, 1942. Remarkably, despite intense Zero-sen operations over Darwin during 1942–43, this was the only example to crash on land. Also visible are two huge 72-gallon drop tanks, a single example of which was always carried beneath the fighter's centerline and then routinely jettisoned before combat. Many of these were recovered intact over northern Australia. (Angie Clucas/Darwin Aviation Museum)

A5M had made its operational debut during the Second Sino-Japanese War, made the IJNAF realize the importance of long range in a fighter. Indeed, it calculated that an endurance of six to eight hours at economical cruising speed was required, as well as a heavy armament that included two 20mm cannon. Furthermore, the new fighter needed to be at least as maneuverable as the A5M, but barely any larger so that it could fit into cramped carrier hangar bays and operate safely from flight decks.

So onerous were these requirements that Nakajima thought they were unachievable and did not produce a design. Undaunted, the chief designer at Mitsubishi, Jiro Horikoshi, decided that the key to creating such a fighter was to keep it as light as possible. Part of the solution lay in a new top-secret aluminum alloy developed by Sumitomo Metal Industries in 1936. Called "extra super duralumin" (ESD), it was lighter, stronger and more ductile than other alloys used in aircraft manufacture. Horikoshi made extensive use of ESD in his design, greatly reducing the weight of the fighter. In addition, equipment installed in the design would be kept to a minimum. There would be no weighty armor or self-sealing fuel tanks, for example, the decision being made to exclude them so that the fighter could achieve the endurance the IJNAF required.

The new aircraft was given the IJNAF designation Type 0 carrier fighter, with the "0" referring to the year 2600 (1940) in the Japanese imperial calendar. In IJNAF service the name of the fighter was often abbreviated to Rei-sen, meaning "Zero fighter." In mid-1942 the A6M (the "A" denoted that it was a carrier-based fighter, the "6" meant it was the sixth such fighter flown by the IJNAF and the "M" represented its manufacturer, Mitsubishi) was given the Allied reporting name "Zeke," and both "Zero" and "Zeke" were commonly used during the war.

The prototype 12-shi Carrier-Based Fighter first flew in April 1939 – less than six months after the first flight of the XP-40. The Mitsubishi aircraft, which would soon be redesignated the A6M1, evolved into the A6M2 Model 11 when its 780hp Mitsubishi Zuisei 13 radial engine was replaced with a 940hp Nakajima Sakae 12. This was the Zero-sen variant that was sent to China in July 1940 for combat trials, which soon proved how effective the A6M was. After just 65 Model 11s had been built, production switched to the A6M2 Model 21, which had larger fuel tanks and folding wingtips for carrier use.

Ultimately, more than 1,500 A6M2 Model 21s were built, and it was this model that proved to be such a deadly opponent to the P-40E – and most other Allied fighter types – during 1941–42.

TECHNICAL SPECIFICATIONS

Both the A6M2 Zero-sen and the P-40E Warhawk were conventional monoplane fighters of similar layout and dimensions. The IJNAF aircraft had a slightly wider wingspan, while the overall length of the P-40E was slightly longer. The biggest difference between them, however, was in respect to their weight. The empty weight of a P-40E was some 60 percent heavier than an A6M2! Not surprisingly, this meant both aircraft had vastly different wing loadings. Despite the Zero-sen having less power, its relatively low wing loading gave it better maneuverability, rate of climb and acceleration. Both types were fairly evenly matched in respect to level speed.

Neither aircraft was particularly good at high altitude, with both having relatively modest service ceilings by the standards of their contemporaries during the early years of World War II. Indeed, the performance of the P-40E fell away markedly from about 15,000ft as its supercharger was only rated for low-medium altitudes. Again, the low wing

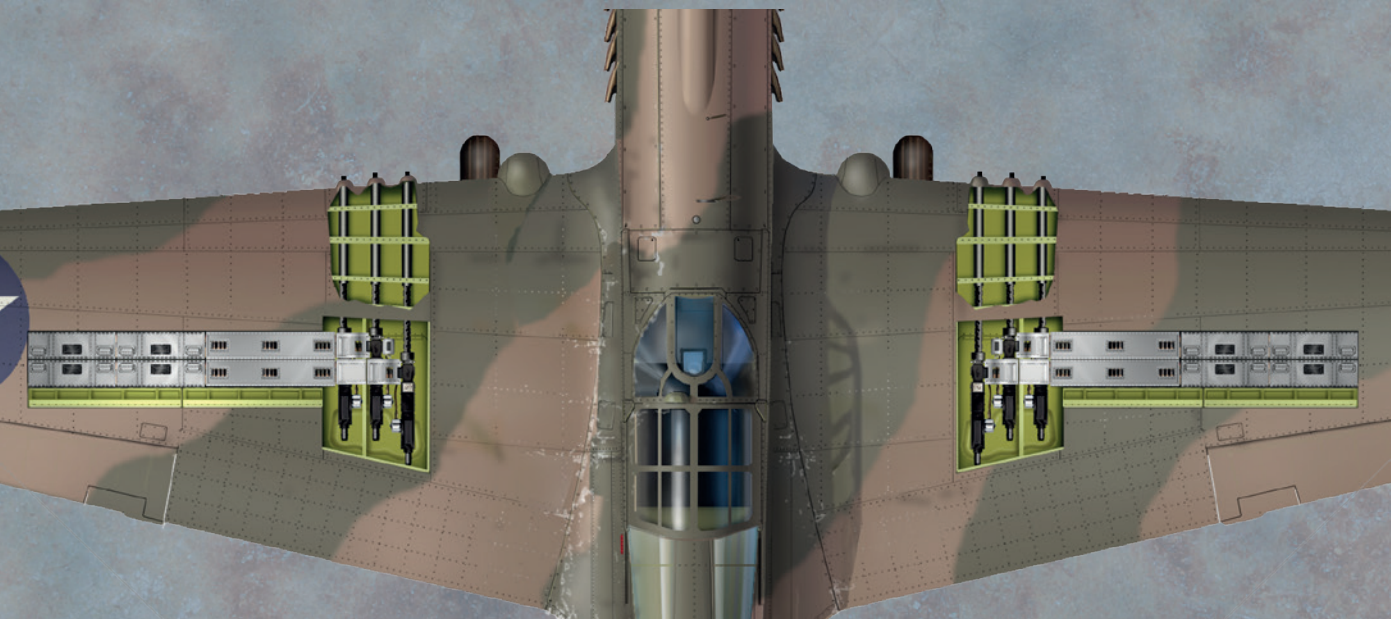
P-40B fuselages progress along the production line at the Curtiss-Wright factory in Buffalo, New York, circa 1940–41. The April 1939 USAAC order for 524 P-40s was, at that time, the largest ever placed for an American fighter. Curtiss had to expand its factory space fourfold in order to fulfil the order. (Getty Images)

loading of the Zero-sen was a saving grace here, and it meant that higher up in thinner air the A6M2 could outperform the P-40E, but not by a large margin. Conversely, the weight of the Warhawk gave it a much faster diving speed than the Zero-sen. If a P-40E pilot could start a fight with an altitude advantage, he then had the option to either make fast diving attacks at his opponent with relative impunity or exit the combat at the time of his choosing.

Another major difference between the American and Japanese fighters was their respective endurance. The range of the A6M2 was immense by the standards of 1940–42, and through the routine use of a large centerline drop tank and suitable economic flying methods, a combat radius of 600 miles could be obtained. This was

P-40E WARHAWK ARMAMENT

The P-40E was armed with six Browning M2 0.50-cal machine guns, with three mounted closely together in each wing. Even in the hot and dusty conditions synonymous with operations in northern Australia, where most maintenance was performed outdoors, these weapons proved extremely reliable during the 1942 campaign. This was largely because of the exacting maintenance standards imposed by the 49th PG/FG, which saw the guns regularly removed, cleaned and recalibrated. Against the lightly built and unarmored IJNAF aircraft, the 0.50-cal round packed a deadly punch, and Zero-sens especially were more likely to be downed rather than damaged when hit. However, due to their relatively large size, just 235 rounds per gun were carried – less than half the 500 7.7mm rounds per gun carried by the A6M2.



unheard of in Allied (or German) fighters at the time, and it enabled the IJNAF to use A6M2s to mount a series of highly effective surprise strafing attacks in the first months of the Pacific War. Many of these raids were falsely attributed to carrier-based aircraft, and it was some time before the actual range of the Zero-sen was fully appreciated.

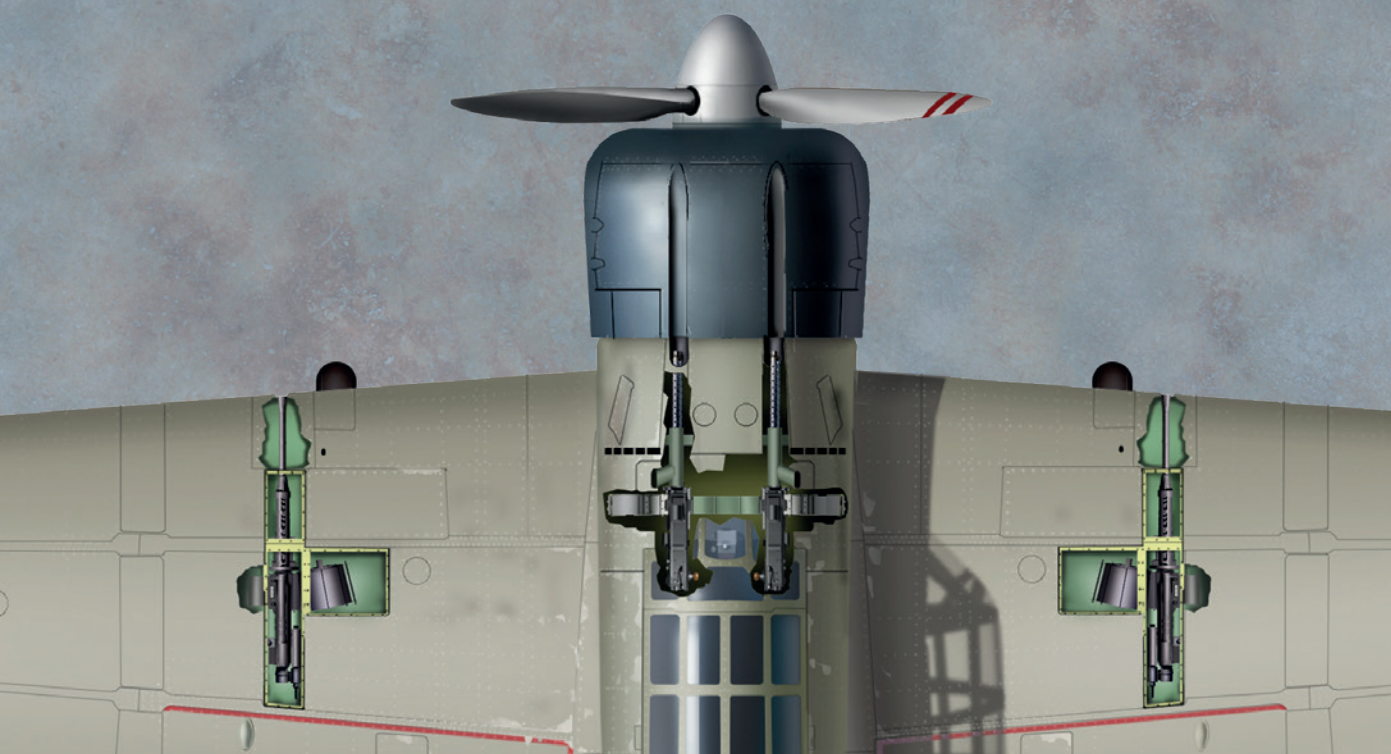
By comparison, the P-40E had a reasonable range for a fighter, but certainly not one that would enable it to escort bombers over the same vast distances as the A6M2. When being used as an interceptor, and climbing fast to meet approaching enemy aircraft, the Warhawk would burn so much precious fuel that pilots had to be mindful of their remaining endurance when entering combat. Drop tanks were routinely used when available.

The armament of the P-40E comprised three 0.50-cal Browning M2 machine guns in each wing. These were excellent, highly reliable weapons that possessed ample destructive power when used against unarmored Japanese aircraft. At least one 49th FG ace – Capt George Kiser, who claimed three Zero-sens destroyed – is reported to have removed

OPPOSITE
The P-40E's battery of six highly reliable Browning M2 machine guns possessed ample destructive power when used against unarmored Japanese aircraft. Here, RAAF armorers reload 0.50-cal rounds into a Warhawk at Strauss in January 1943. (Australian War Memorial)

A6M2 ZERO-SEN MODEL 21 ARMAMENT

The A6M2 was armed with a single Type 99-1 20mm cannon in each wing, just outboard of the propeller arc, and two Type 97 7.7mm machine guns above the engine in front of the cockpit. A synchronizing mechanism enabled the machine guns to fire through the propeller. Although both weapons proved robust and reliable in service, the Type 99-1 cannon had too slow a muzzle velocity and rate of fire to be truly effective in aerial combat. In practice, this meant the Type 99-1 was a deadly weapon during strafing attacks but more difficult to use for deflection shots during dogfights. For this reason, Zero-sen pilots tended to favor their 7.7mm machine guns during aerial combat, although these lacked the destructive power required to down well-built and armored Allied fighters such as the P-40. This was a major contributing factor in the low number of Warhawk pilots killed (just four) in action over Darwin in 1942.



A 49th PG P-40E with its cowling panels removed undergoes an engine test beneath camouflage netting at an airfield near Darwin. The three cylinders underneath the engine are radiators – the top two are for glycol engine coolant while the lower one is for oil cooling. Also clearly visible are the gun ports for the six wing-mounted 0.50-cal Browning M2s. (Michael Claringbould)

the pair of outboard guns in his P-40E to lighten his aircraft and improve performance. However, this modification never became a standard one.

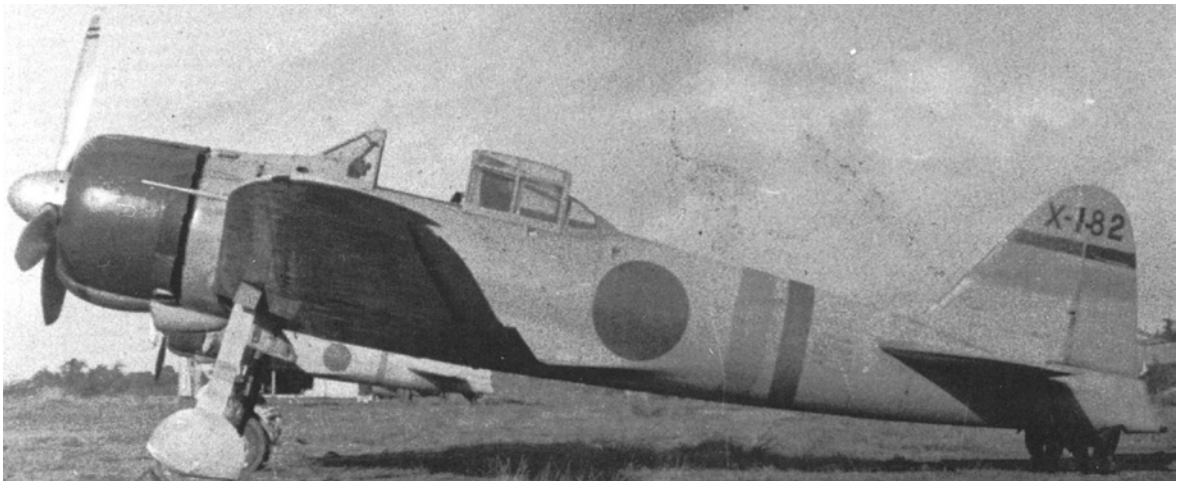
The Zero-sen had a single Type 99-1 20mm cannon in each wing. These packed a heavy destructive punch but had a relatively low muzzle velocity and rate of fire. This made the cannons cumbersome weapons in aerial combat, where high-angle deflection firing opportunities might only present themselves for a split second. Also, the solitary ammunition canister for each weapon held only a very modest 60 rounds per gun. However, the cannons proved particularly deadly when used in the strafing of parked aircraft or moored flying boats. The incendiary effect of the 20mm rounds would frequently cause fuel tanks to explode even if they were empty, as the fuel vapors would readily ignite.

In aerial combat, many Zero-sen pilots preferred to rely on the two Type 97 7.7mm machine guns mounted in the upper engine cowling (the breeches of each weapon extending into the cockpit itself, above the instrument panel). These were reliable guns, and had a reasonable supply of ammunition – 500 rounds per weapon. However, the 7.7mm rounds were small, which meant that hits were generally needed in the cockpit or engine to bring down a well-built American fighter like the P-40E. Indeed, with the Curtiss fighter's extra weight came a very sturdy construction. This proved to be a major advantage in combat, for even if a Warhawk was significantly damaged, the pilot would often survive to bail out or make a forced landing.

In combat over Horn Island on March 14, 1942, 2Lt A. T. House of the 7th PS rammed a Zero-sen in mid-air. Although the latter disintegrated in a shower of debris, the Warhawk remained aloft despite having a badly damaged wing. House was able to make a safe landing, albeit a "hot" one without flaps.

While the A6M2 was equipped with a radio as standard equipment, many pilots flying in land-based units removed them. This is often described as a weight-saving issue (and the early radios were also very unreliable), but given their mission type and strict aerial discipline, the IJNAF pilots did not have much need for radios in any case. Flying together for long periods of time in their small three-aircraft shotai formations, they developed close cooperation and the ability to communicate through the employment of visual signals, rather than via radio. In contrast, the P-40E pilots flying interception missions relied heavily on radio direction from ground controllers. They also used their radios while in the air, but when combat developed it was often of limited use for communication, as all the aircraft operated on the same frequency and the air waves were prone to being blocked by excited aviators shouting incessantly.

The canopy of the Zero-sen was raised and gave the pilot a good all-round view – one of the first fighter canopies to do so. In contrast, the P-40E canopy was faired into the rear fuselage, restricting the pilot's vision aft.



A6M2 X-182 of the 3rd Kokutai at Lakunai, Rabaul, in September 1942. This Zero-sen was probably flown by ace Lt Zenjiro Miyano when he led the long-range raid on Broome on March 3, 1942. The fighter remained with the 3rd after Miyano left the unit the following month, and it is seen here with one command band and tail stripe crudely overpainted. (Yasuho Izawa)

Both the A6M2 and the P-40E developed a good reputation for reliability, and they generally coped well with the tough environments of the East Indies and northern Australia. Indeed, the durability of the Zero-sen's Sakae 12 engine proved exceptional during the regular long over-water flights pilots made between Timor and Darwin, resulting in very few aircraft being lost to mechanical failure.

	P-40E Warhawk	**A6M2 Zero-sen**
Powerplant	1,240hp Allison V-1710-39	950hp Nakajima Sakae 12
Performance		
Max Speed	334mph at 14,000ft	331mph at 14,930ft
Service ceiling	29,100ft	32,500ft
Weights		
Empty	5,922lb	3,704lb
Loaded	8,515lb	6,164lb
Dimensions		
Span	37ft 3.5in.	39ft 4.7in.
Length	31ft 8.5in.	28ft 8in.
Height	10ft 8in.	10ft 0in.
Wing loading	35.1lb/ft^2	22lb/ft^2
Fuel		
Internal fuel	157 gallons	150 gallons
Drop tank	52 gallons	72 gallons
Combat radius	200 miles	600 miles
Armament	6 x 0.50-cal Browning M2 machine guns in wings (235 rounds per gun)	2 x 20mm Type 99-1 cannon in wings (60 rounds per gun) 2 x 7.7mm Type 97 machine guns in fuselage (500 rounds per gun)

THE STRATEGIC SITUATION

P-40Bs of the FEAF's 20th PS/ 24th PG based at Clark Field in the Philippines in 1941. Serving alongside three squadrons of P-40Es, these aircraft represented a reasonably modern fighter force. However, the Curtiss fighters were soundly defeated by Zero-sens flying long-range missions from Formosa in the first days of the Pacific War. (Getty Images)

On December 8, 1941, just hours after the Pearl Harbor attack, Japanese forces targeted Malaya and the Philippines. What followed was a lightning conquest of Southeast Asia. In the west, Japanese forces moved down the Malayan Peninsula towards Singapore. Further east, another axis of advance was opened through the Philippines that would soon threaten the NEI.

During the first week of fighting in the Philippines, the USAAC's Far East Air Force (FEAF) had taken a severe beating. Although equipped with much-vaunted B-17 Flying Fortresses and three squadrons of P-40Es (this was the first time that E-model Warhawk and Zero-sen had met in combat), together with some P-40Bs and obsolescent Seversky P-35s, half of the effective fighting strength of the FEAF was wiped out on the ground.

Japanese air power seemed insurmountable, and Allied fighters were desperately needed to try and stem the tide. Only modern aircraft could hope to blunt the aerial offensive being mounted by both the IJNAF and the Imperial Japanese Army Air Force (IJAAF). However, the few P-40Es in the Philippines were fast being expended. What else was available to

Key Airfields
BORNEO
Celebes
Pare Pare
Kendari
Makassar
Pomelaa
Buru
Ceram
Ambon
Babo
NETHERLANDS
NEW GUINEA
NETHERLANDS EAST INDIES
Banda Sea
Flores Sea
Soerabaja
Java
Bali
Lombok
Denpassar
Flores
Wetar
PORTUGUESE
TIMOR
DUTCH
TIMOR
Waingapoe
Soemba
Semau Is.
Koepang
Roti Is.
Timor Sea
Arafura Sea
Bathurst Is.
Melville Is.
Darwin
Batchelor
INDIAN OCEAN
Gulf of Carpentaria
WESTERN AUSTRALIA
NORTHERN TERRITORY
Derby
Broome
QUEENSLAND
N
0
200 miles
0
200km

PREVIOUS PAGE
This map shows northern Australia and much of the eastern NEI. At the start of the Pacific War all of this area was in Allied hands, but by March 1942 virtually all of the NEI was under Japanese control. For a brief period in January and February 1942 USAAC P-40Es flew from Darwin to Java, where they participated in a last-ditch defense of the island. These aircraft used an air route via Koepang and either Waingapoe, on Soemba, or Denpassar, on Bali, before reaching Java. During 1942 the key airfield used by the 3rd Kokutai was Kendari, with Koepang employed as an advanced base from where the Zero-sens could range over the Darwin area.

the Allies at this time? Immediately to the south of the Philippines was the eastern NEI, which was home to a number of strategic airfields from where reinforcements might arrive. With Dutch fighter strength concentrated on Java, paltry numbers of Buffaloes were available to protect the eastern NEI. For example, by mid-January 1942 a detachment of just two Buffaloes was defending the key base of Ambon.

The next territory in line for invasion after the NEI was Australia. Astonishingly, the RAAF did not possess a single modern fighter at the time of the attack on Pearl Harbor. Since the start of the fighting in Europe in September 1939, Australian defense policy had been largely formulated in the context of the war against Germany. This had resulted in the RAAF being kept busy training pilots for service in Europe and the Middle East. It was believed that coastal patrol squadrons flying Hudsons, Catalinas and Wirraways could adequately defend Australia from the expected maritime threat posed by German surface raiders and U-boats.

In fact, Australian defense guarantees from the Britain government (in return for the supply of men to fight the war in Europe and the Middle East) centered on "Fortress Singapore." Indeed, it was to here that Allied troops and materiel was urgently being sent following the Japanese attacks in the region. Amongst the aircraft despatched were 99 Hurricane fighters originally destined for service in North Africa. It was believed that they would prove more than adequate for the defense of both Malaya and Singapore, thus helping to stop the Japanese advance in its tracks. None could be spared for service in Australia, however.

It should be noted that just at this time the northern Australian town of Darwin had attained a strategic significance never foreseen by pre-war defense planners. This was by way of an aerial route to reinforce both the Philippines and the NEI. Before the war, airliners flown by KNILM (*Koninklijke Nederlandsch-Indische Luchtvaart Maatshappij* – Royal Dutch Indies Airlines) regularly stopped off at Darwin when flying between Batavia and Sydney. Qantas Short Empire flying boats also used the town for refueling when flying from Sydney to Singapore and beyond.

In September 1941, the first flight of B-17D Flying Fortresses to arrive in the Philippines had flown from Hawaii via Darwin to Manila. A short time later a

B-17Ds during a refueling stop in Darwin in late 1941 while on their way to join the FEAF in the Philippines. At this time the strategic value of the town as part of an important aerial resupply route was just being realized. (Australian War Memorial)

The three main Dutch airfields on eastern Java were Tandjoeng Perak/Soerabaja, Maospati/Madoien and Singosari/Malang. All of these were known to the Japanese and would be repeatedly attacked, as was a smaller auxiliary strip at Pasirian. The P-40Es of the 17th PS (Prov) used a well-camouflaged fighter strip at Ngoro/Blimbing that was only discovered by the Japanese just after the USAAC had ceased operations there on March 1, 1942.

number of FEAF officers, including Capt Floyd Pell (who was later killed flying a P-40E from Darwin), flew into Darwin to properly survey the air route and arrange for stockpiles of 100-octane fuel to be kept at northern Australian airfields for use by US military aircraft. The importance of this air route was underlined when, in mid-December, surviving FEAF B-17s were withdrawn from the Philippines to the relative safety of Batchelor airfield, south of Darwin.

In the first weeks of 1942 replacement B-17Es began using the Pacific air route to fly from the west coast of the USA to Hawaii and then via several Pacific island stops to Darwin. From here, they were flown to Java, where the USAAC heavy bomber force was being concentrated. Also at this time it was hoped that American fighters could be sent via ship to Australia, where they would be assembled and flown via Darwin to the Philippines. This was a lengthy route for single-engined aircraft, with long sectors over the Australian outback, an overwater leg between Darwin and Timor and then shorter island-hopping flights through the eastern NEI to Mindanao, in the southern Philippines. With the FEAF desperately short of serviceable aircraft by early 1942, it evacuated a number of surplus pilots by air to Australia so that they could fly reinforcement fighters back via this route. However, the speed of the Japanese advance through the NEI severed this route before any fights could be made.

Although there were no modern fighters in Australia when the Pacific War began, some arrived relatively quickly. These were 18 crated P-40Es (and 48 pilots) on board vessels within the eight-ship Pensacola Convoy, which had been

A newly assembled P-40E at Amberley, Queensland, in late January 1942. The first P-40Es arrived in Australia as early as December 1941 after being diverted from their original destination of the Philippines. (Bob Alford)

at sea *en route* to the Philippines from Pearl Harbor since November 29, 1941. Diverted to Brisbane after the Japanese attacks, the vessels arrived there on December 23. Further transports carrying more Warhawks and pilots were sent from the USA to Australia, arriving from mid-January 1942.

After some delays, the initial batch of 18 P-40Es was assembled and the first of five pursuit units was hastily formed in Australia. These were known as "provisional" squadrons, as they only existed for a comparatively short time and were never formally raised by the USAAC. The first squadron, the 17th PS (Prov), flew from Brisbane to Darwin in mid-January 1942 with the intention of then heading on to the Philippines. However, by this time Japanese advances had cut the route through the eastern NEI to Mindanao. Instead, the 17th PS (Prov) was sent to Java. It would soon be joined there by flights from the 3rd and 20th PS (Prov) that had suffered significant attrition along the air route to the NEI. Collectively, the surviving Warhawk pilots spent February battling A6M2s of the Tainan and 3rd Kokutai in the ill-fated defense of Java. These engagements would be the first of many sustained combats between formations of P-40Es and Zero-sens.

During February two momentous events occurred. The first was the fall of Singapore on the 15th, which then allowed the Japanese to focus on the capture of Java and ended any chance Britain had of contributing towards the defense of Australia. The second was the raid on Darwin on the 19th. Conducted by four fleet carriers, this would remain the largest attack ever undertaken by Japanese forces in the South-West Pacific Area (SWPA). Darwin's wharf and most of the facilities at the town's RAAF base were destroyed. The latter had been built in the context of the RAAF's perceived pre-Pacific War coastal patrol role, which meant it had not been designed to withstand a full-scale aerial assault.

The Darwin raid came as a huge shock to the Australian population, and it seemed that such a largescale attack could only be a precursor to an invasion of the

In early 1942 there were only two large airfields available near Darwin, these being RAAF Darwin and Batchelor further inland. Following the February 19, 1942 raid, additional airfields were quickly constructed alongside the Stuart Highway. When the 49th PG initially moved to the area it used RAAF Darwin, Batchelor and a small civil field at Adelaide River until the new strips were ready. Subsequently, the three fighter squadrons settled into bases at RAAF Darwin, Strauss and Livingstone. Another field at Hughes was used by RAAF Hudsons.

north of the country. However, it was not realized at the time that the strike was really about ensuring there would be no interference with the Japanese occupation of Timor, which went ahead later that same day (February 19). Together with the invasion of Bali, the occupation of Timor severed the air route to Java. Less than three weeks later Java itself was invaded, and the Japanese conquest of Southeast Asia was complete.

The one positive for Australia following the fall of the NEI was that the increasing number of P-40E and P-39 Airacobra fighters arriving from the US would now only be used for the defense of Australia and New Guinea. To this end, the first complete USAAC fighter group to arrive in-country, the 49th PG, was equipped with newly assembled P-40Es and from March began deploying to Darwin from airfields near Sydney and Canberra. Boasting a number of veterans from the fighting in the Philippines and Java amongst its pilot cadre, the 49th PG was well led in its six-month-long defense of Darwin during the dry season of 1942.

The group's opponents would be large formations of G4M "Betty" bombers escorted by A6M2 Zero-sens of the 3rd Kokutai (one of the best and most experienced of all IJNAF fighter units). A number of large-scale aerial clashes would erupt in the skies over Darwin as the P-40E was forced into the role of interceptor – a task for which it had not been designed.

THE COMBATANTS

PROVISIONAL P-40E SQUADRONS

Amid much urgency in January and February 1942, five American pursuit squadrons were formed in Australia. These were subsequently rushed to Java and only existed for a period of weeks. Three of the squadrons were named after Philippine-based FEAF P-40 units, namely the 3rd, 17th and 20th PSs. However, these "new" units were never formally promulgated, and the original squadrons bearing these numbers remained operational (albeit without aircraft) as ground units in the dogged defense of Bataan. The other two newly formed units were the 13th and 33rd PSs. Why these squadron numbers were chosen is unclear, for a 13th PS was already operational in Panama and a 33rd PS was based in Iceland. For these reasons, all five squadrons are suffixed as "Provisional."

As previously noted, the Provisional units were equipped with the first fighters to arrive in Australia just weeks after the outbreak of the Pacific War. Eighteen crated P-40Es were on board a merchant vessel within the Pensacola Convoy bound for the Philippines when the Pacific War broke out. Named after the escorting US Navy heavy cruiser USS *Pensacola* (CA-24), the convoy was diverted to Brisbane, where it arrived on December 23, 1941.

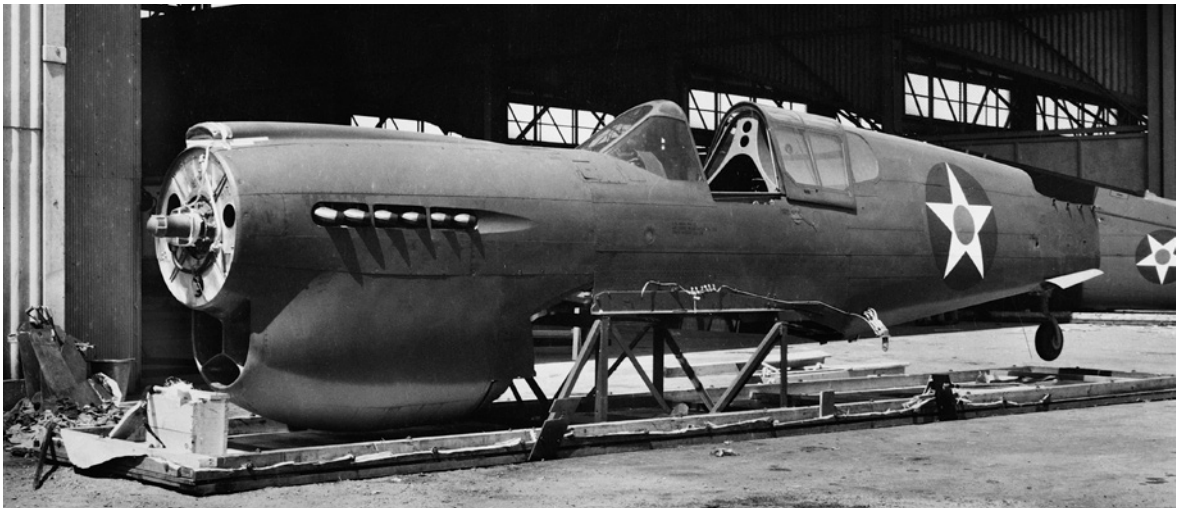
Along with 18 P-40Es, 48 pilots of the 35th PG were embarked in the troop transport USS *Republic* (AP-33), which had left San Francisco on November 21, 1941. The pilots had been selected for overseas duty at a location known only by the codename "Plum." Although the destination was secret, most of the pilots had correctly deduced they had been selected for duty in the Philippines. Virtually all of them were inexperienced, having graduated from 1941 flight school classes 41-E, -F

and -G. Just two pilots, Hubert Egenes and Dwight Muckley Jr, were from 1940 classes. Most of the remainder had only five to ten hours of flight time in a P-40. For some, their gunnery experience had been limited to firing just 50 rounds of 0.30-cal ammunition from a single gun of a P-40B/C.

Five days prior to the Pensacola Convoy reaching Brisbane, the American President Lines' transport SS *President Polk* had left San Francisco with 55 pursuit pilots and an identical number of P-40Es on board. The aviators consisted of 27 men from the 35th PG, plus a mixed bag of 28 reinforcement pilots drawn from the 14th, 20th and 51st PGs – on December 14, these groups had been ordered to fulfill quotas for pilots needed for "Plum." By this time news of disasters at Pearl Harbor and the Philippines was widely known, and there were no volunteers for this unenviable posting. Instead, most of these men were selected randomly. Some of the pilots were even more junior than those in the Pensacola Convoy, having only graduated from class 41-H as recently as October 31.

Polk arrived in Brisbane on 13 January 1942 after a four-week journey and a brief stopover in New Zealand. It also carried the first P-40 groundcrew – mechanics and armorers – to reach Australia. By this time a number of veteran pursuit pilots had arrived from the Philippines, with the idea that they would collect fighters in Australia and fly them back into combat. By the end of January some 19 pilots had arrived by various means, including two groups who had survived hair-raising flights in Beech Model 18 light transports. Among them were three senior pilots from 1938 flight school classes, Capts Floyd Pell and Charles Sprague and future ace 1Lt Boyd Wagner. Most of the others had been in the Philippines since December 1940.

With the arrival of the 18 Pensacola Convoy P-40Es, there was some urgency in getting them airworthy. First, the crated fighters were trucked to RAAF Amberley, to the west of Brisbane, where the problems soon started. There were initially no mechanics available with P-40 experience, and no proper tools for their aircrafts' assembly. Instead, pilots were sent to supervise the process, and, amid much trial and error, just seven had been assembled by the end of the first week of January. Another



An uncrated P-40E fuselage at Amberley in January 1942. All of the Warhawks arrived in Australia in crates, and it took some weeks before an effective assembly line was set up, due to the lack of groundcrew in Australia with suitable experience. Proper tools for the aircrafts' reassembly were also missing, and there was a shortage of the Prestone coolant needed for the P-40's liquid-cooled Allison engine. (Australian War Memorial)

Capt Grant Mahony would not stop fighting. He flew in the Philippines, scoring his first victory (over a Zero-sen) on December 8, 1941, then added three more (two of them A6M2s) while flying with the 17th PS (Prov) in Java, before becoming an ace flying P-51As in the China-Burma-India theater in 1944. Mahony later flew with the 1st Air Commando Group in India and the 8th FG in the Philippines, where he was killed in action on January 3, 1945. (Carl Molesworth Collection)

problem was a lack of Prestone coolant needed for the P-40's liquid-cooled Allison engine – virtually none had been sent with the initial batch of fighters, and this held up test flying.

These problems were gradually overcome, however, and by mid-January the first batch of 17 P-40Es had been assembled and test flown (an 18th machine sent with the Pensacola Convoy was found to be incomplete). The next aircraft to be rebuilt by the improvised assembly production line at Amberley were the 55 P-40Es from SS *President Polk*, followed by 67 that arrived in Brisbane in late January on board the SS *Mormacsun*. Further deliveries would continue in February, most notably 111 on board the aircraft transport USS *Hammondsport* (APV-2). By the middle of March more than 300 P-40Es had arrived in Australia.

With aircraft assembly finally picking up pace in January 1942, the USAAC decided to form an operational squadron as quickly as possible in the hope that it could be flown via Darwin and the NEI to the Philippines. Called the 17th PS (Prov), it was led by Philippines veteran Capt Charles "Bud" Sprague. He had 16 pilots under his command, 12 of them from the Philippines. The remaining four were among the more experienced of the recent arrivals from San Francisco, being class 41-E graduates. This squadron was equipped with the 17 ex-Pensacola Convoy P-40Es, and so was below the normal 25-aircraft strength of a standard USAAC pursuit squadron at that time.

On January 16 Sprague led them off on the long overland ferry flight to Darwin via Rockhampton, Townsville, Cloncurry and Daly Waters (subsequent flights took a more inland route via Charleville). The total distance covered was some 2,000 miles. In Darwin, the pilots were met by Maj Gen Lewis Brereton, who had commanded the FEAF in the Philippines and who was now in charge of American air forces within the newly instituted American-British-Dutch-Australian Command (ABDACOM). Brereton advised Sprague and his men that Japanese landings in the NEI had effectively severed the air route to the Philippines. Instead, the squadron was ordered to Java to assist Dutch forces

there. From Darwin, the P-40s were flown over the Timor Sea to Penfui, in Timor, and then on to either Waingapoe or Denpassar for one final refueling stop, before arriving in eastern Java.

Also while in Darwin, Sprague's 17th PS (Prov) pilots had been joined by 22 enlisted airmen who had been flown from Amberley in two RAAF DC-2s. These were the groundcrew that would serve the squadron in Java. Historian Bill Baartsch described how Sprague called his pilots together to discuss relationships within the squadron:

> He informed them that military protocol would be relaxed so that they could better accomplish their mission. They should get acquainted with the crew chiefs and armorers assigned them. He reminded them that the enlisted men had not been paid. They should share what little money they had with their crew chiefs and armorers. The recommendation was readily accepted.

Meanwhile, back at Amberley on January 24, 1Lt William Lane, who had commanded the 35th PG pilots on board *Polk*, was ordered to form the 20th PS (Prov). Rather than pick any of the remaining veterans from the Philippines, Lane chose pilots he had known from the *Polk* voyage and a few of the most senior ones from the Pensacola Convoy. His squadron was originally earmarked for Port Moresby, but the destination was soon changed to Java. After some delays due to bad weather, the 20th PS (Prov) finally departed on January 29 and arrived in Darwin two days later.

On January 27, Philippine veteran 1Lt Grant Mahony was ordered to form the 3rd PS (Prov). However, Mahony could find only three other fellow Philippine veteran pilots to join him. The remainder were picked from classes 41-E and -F – the best of the large pool of graduate pilots who had been trying to get as much P-40 time as possible while at Amberley. Mahony's squadron left for Darwin on February 5, reaching its destination late the following afternoon. The P-40 pilots were aided in

OPPOSITE
A line-up of 17th PS (Prov) P-40Es at Townsville in mid-January 1942. This newly formed squadron was then *en route* to the Philippines, having been equipped with the first Warhawks to arrive in Australia. However, on arrival in Darwin, the squadron, under the command of Capt Charles Sprague, was diverted to Java instead. (Australian War Memorial)

A USAAC Beech Model 18 utility aircraft shares the flightline at Archerfield, Queensland, with four P-40Es, two Avro Ansons and a B-17D in early 1942. This aircraft had arrived in Australia from the Philippines carrying several experienced pursuit pilots who would fill leadership roles in the newly formed "provisional" squadrons. It subsequently assisted with the ferrying of P-40Es to Java before being one of two Model 18s destroyed during the Darwin air raid on February 19. (Australian War Memorial)

FP01c Yoshikazu Nagahama claimed a PBY Catalina and four P-40Es (all from B Flight of the 33rd PS (Prov)) shot down during the attack on Darwin on February 19, 1942. Flying an A6M2 from *Kaga*, Nagahama was also a veteran of the attack on Pearl Harbor. Having survived the sinking of his carrier during the Battle of Midway and extensive combat in the Solomons (including participation in the Battle of the Santa Cruz Islands), he was killed in a flying accident in Japan in September 1943. Nagahama was credited with ten victories while flying from carriers. (Yasuho Izawa)

their ferry flights by other aircraft acting as navigational guides. These were most often USAAC B-17s and B-24s, although Beech Model 18s and even RAAF Fairey Battle bomber trainers were also used. These aircraft also carried critical spare parts, shuttled pilots back and forth between stranded P-40s left behind due to mechanical problems and transported ground personnel to Java.

Aside from Darwin and Townsville, which were well equipped RAAF airfields, most of the stops along the route to Java offered nothing more than a landing strip and a fuel dump. Attrition was high, with various accidents and technical problems. Some of the latter were relatively minor in nature, such as burst tyres or bent propellers, but could result in a delay of some days to facilitate repairs or until a replacement part could be flown in.

The airfield at Penfui offered the additional risk of Japanese attacks – a stranded P-40 was strafed and destroyed there by Zero-sens on January 26. Also within range of Japanese fighters was the final refueling stop at Denpassar, on Bali. On February 5, 12 P-40s of the 20th PS (Prov) were surprised there by ten A6M2s from the 3rd Kokutai and severely mauled. Five Warhawks were shot down and two destroyed on the ground. When the remaining fighters from the 20th PS (Prov) arrived in Java they were incorporated into the 17th PS (Prov).

The tropical weather conditions combined with pilot inexperience also exacted a toll. On February 9 eight 3rd PS (Prov) P-40s were approaching Timor from Darwin when they ran into a severe tropical rainstorm. All eight failed to find Penfui airfield and force landed. Together with other losses on the Australian leg of the route, barely half the squadron arrived in Java, where it too was merged into the ranks of the 17th PS (Prov).

3rd PS (Prov) pilots 2Lts Robert Buel and Robert Oestreicher were left behind in Darwin at this time due to mechanical faults with their aircraft. When their fighters were repaired, both men flew patrols from Darwin. These two P-40s were the only fighters then available to defend this increasingly important base for a number of days. On February 15 Buel was killed during an interception of a Kawanishi H6K "Mavis" flying boat over the Timor Sea. While the American pilot succeeded in shooting down the aircraft, he almost certainly fell victim to the flying boat's defensive fire. This "Mavis" was the very first aerial victory achieved by an aircraft operating from an Australian base.

The 13th and 33rd PS (Prov) were not formed until early February, and these units included some of the most junior graduate pilots from classes 41-G and -H. Both squadrons were involved in a rushed plan to fly 32 P-40Es across Australia from Melbourne to Perth, from where they would be loaded onto the carrier *Langley* for transport to Java. In conjunction with this plan, other crated P-40s intended for these groups were sent directly to Java for assembly there. However, no elements from either of these squadrons would ever arrive in Java. Halfway to Perth, the bulk of the 33rd PS (Prov) was ordered north to Darwin to help protect a convoy on its way to Timor. Shortly after arriving in Darwin, nine P-40s were lost to Zero-sens from the carriers *Akagi*, *Kaga* and *Hiryu* as they tried to oppose the massive IJNAF carrier attack on February 19. Four pilots were killed, including the squadron commander Maj Floyd Pell. A tenth P-40E, flown by 2Lt Robert Oestreicher of the 3rd PS (Prov), was the sole survivor of the attack.

Meanwhile, 33 pilots from the 13th and 33rd PS (Prov) had embarked in *Langley*. Prior to reaching Java, the carrier was mortally damaged by IJNAF G4M "Betty" bombers south of Tjilatjap, Java. All bar two of the pilots survived the attack and were rescued by the escorting destroyer *Edsall*. However, on March 1, this vessel was sunk by IJN warships, taking with it some 31 pilots.

So it was that just one understrength squadron, the 17th PS (Prov), and roughly half of two others (3rd and 20th PS (Prov)) managed to reach Java in January–February 1942. Merged into a single squadron, the Warhawk pilots fought a desperate last-ditch campaign until early March. Meanwhile, a complete P-40 pursuit group in the form of the 49th PG had arrived in Melbourne on February 1. While the unit's pilots would soon be in combat, in stark contrast to the rushed formation and departure of the provisional squadrons, the 49th benefitted greatly from several weeks of training.

49th PG

The 49th PG was activated in mid-January 1941 at a wintery Selfridge Field, Michigan, its three constituent squadrons being the newly formed 7th, 8th and 9th PSs. However, equipment limitations meant that little flying was undertaken until after the group had moved to the more comfortable climes of Morrison Field, Florida, in May 1941. That summer, each squadron was equipped with a Boeing-Stearman PT-17 Kaydet biplane trainer, a Ryan PT-22 monoplane basic trainer, three P-35s and a single P-40C. The four fighters were used for advanced training, although the Seversky monoplanes were in poor condition following years of service and their Twin Wasp radial engines never delivered full power. After a fatal accident in September, the remaining P-35s were grounded, pending overhauls, and training fell behind schedule.

Shortly after the group received news of the Pearl Harbor attack, a new commanding officer arrived who would revitalise the 49th. This was Maj Paul Wurtsmith, a fighter

The remains of 2Lt William Walker's P-40E, which crash-landed at RAAF Darwin following combat with Zero-sens from *Kaga* during the February 19, 1942 air raid. Walker and his flight leader, 1Lt Max Wiecks, were bounced from above by eight A6M2s and their Warhawks mortally damaged. Wiecks bailed out and Walker, who had been wounded in the shoulder, managed to crash-land at high speed when his flaps refused to extend. Although Walker and Wiecks survived their combat with the veteran pilots from *Kaga*, four of their squadronmates from the 33rd PS (Prov) did not. Amongst those killed was the unit CO, Maj Floyd Pell. In the background is a water tank that was also used as a control tower. (Bob Alford)

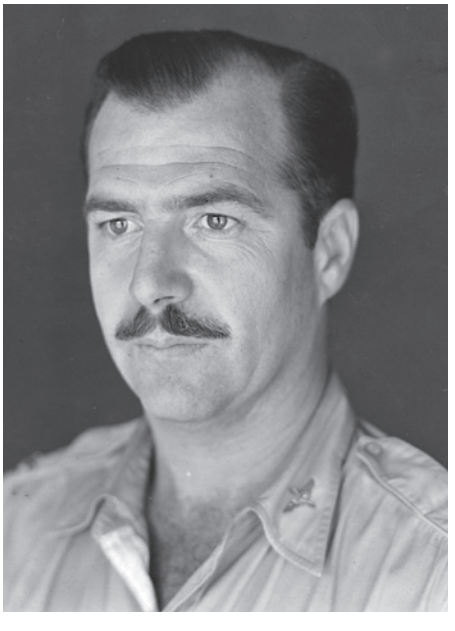
pilot of substantial experience. Wurtsmith had earned his wings in 1928 and had since accumulated 4,800 hours of flying time, mostly in pursuit aircraft. He would subsequently prove to be an exceptional leader of the 49th PG and one of the stand-out USAAF officers in the SWPA. His impact was immediately felt, with a near doubling of training hours for the remainder of December 1941.

Christmas 1941 brought orders for the 49th to prepare for overseas deployment. On January 4 the unit departed Florida, and after a four-day trans-American rail journey arrived in San Francisco. Here, Wurtsmith and his staff found a large pool of airmen in transit, from which they were able to sign up 75 new pilots and 587 enlisted personnel. Among the latter were specialist mechanics and electricians. On January 12 the unit embarked aboard the transports SS *Mariposa* and SS *President Coolidge*. The 49th thus became the first fighter group formed in the US to be sent overseas as a unit.

The 49th PG disembarked from Port Melbourne on February 2 and was sent to Camp Darley, about 30 miles to the west of the Victorian capital. However, after a week, the unit was soon on the move. The 7th PS went to Bankstown (a civilian airfield in Sydney), the 8th PS moved to RAAF Fairbairn, Canberra, and the 9th PS was transferred to RAAF Williamtown, near Newcastle to the north of Sydney. These movements were complicated by some senior personnel assisting with the ferrying of P-40s west to Perth for the ill-fated *Langley* venture. However, most elements had arrived at their new locations by February 16.

Fortunately for the 49th PG, with the Java-bound provisional squadrons no longer being assigned recently arrived Warhawks, the group was able to get reasonably quick access to newly assembled P-40Es from Amberley. Each of the three squadrons was allocated 25 aircraft, with another ten going to the Headquarters Squadron that had previously been an administrative rather than a flying unit. At least ten more P-40Es were held as reserves. Following this allocation of aircraft, an operational training program was quickly implemented. Wurtsmith (now promoted to Lieutenant Colonel) and some senior pilots were relatively experienced. For example, six aviators, including the three squadron leaders, had each accrued more than 600 hours of pursuit aircraft flying. However, another nine pilots had just 15 hours, while 89 – including many barely advanced beyond their training program who had joined the group in San Francisco – had no pursuit time at all.

Paul Wurtsmith (seen here as a full colonel) was a career aviator who had enlisted in the US Army in 1928 and earned his wings four years later. Given command of the P-40C-equipped 49th PG just five days after the attack on Pearl Harbor, he led the group into action in the defense of Australia in early 1942. In November of that year Wurtsmith was put in charge of the Fifth Air Force's V Fighter Command at Port Moresby. Promoted to brigadier general in 1943, he oversaw a force of five fighter groups. In 1945 Wurtsmith was given command of the Thirteenth Air Force, which saw combat over the Philippines. He took up a senior position within Strategic Air Command the following year, only to be killed while flying a B-25 in bad weather on September 13, 1946. (NARA)

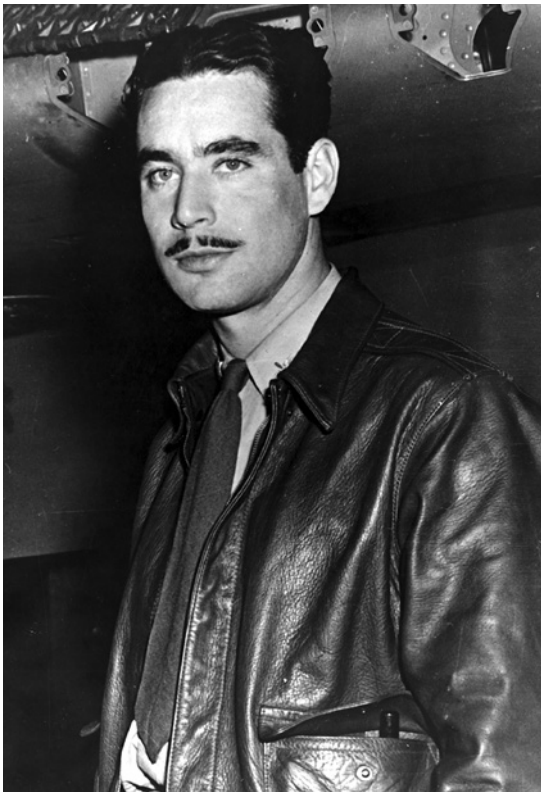


The initial training of these pilots is described by 49th PG historians Steve Ferguson and William Pascalis in the following extract from their volume *Protect & Avenge – The 49th Fighter Group in World War II*:

> The adventure, or chaos, then began. At the Bankstown, Fairbairn and Williamtown aerodromes, Yankee fighter pilots careened their Warhawks across the fields to the shouts of squadron mates waiting their turns, and the anxious plea of the instructor over the radio to "trim it up, Lieutenant." The first flight was once around the pattern, with gear in the down position, to a final approach "talkdown" and landing back at the 'drome. Proceeding flights summarily included retracted landing gear and greater distances.

P-40E WARHAWK COCKPIT

1. N-3A reflector gunsight
2. Ring gunsight
3. Flap and wheel indicator
4. Compass
5. Artificial horizon
6. Coolant temperature gauge
7. Fuselage fuel gauge
8. Turn-and-bank indicator
9. Turn indicator
10. Airspeed indicator
11. Tachometer
12. Manifold pressure gauge
13. Oil temperature gauge
14. Engine gauge unit
15. Rate-of-climb indicator
16. Altimeter
17. Oxygen indicator
18. Oxygen pressure gauge
19. Oil pressure gauge
20. Fuel pressure gauge
21. Parking brake
22. Gun arming switch
23. Undercarriage warning lights
24. Carburetor heat control
25. Canopy control crank
26. Throttle
27. Mixture control
28. Propeller pitch control
29. Ignition switch
30. Compass control
31. Ammeter
32. Cockpit heat control
33. Rudder trim tab control
34. Elevator trim tab control
35. Fuel selector
36. Rudder pedals
37. Control column
38. Gun firing button
39. Forward wing tanks fuel gauge
40. Hydraulics hand pump
41. Radio receiver
42. Radio transmitter
43. Map case
44. Fluorescent spotlight
45. Wing bomb release
46. Pilot's seat
47. Cowl flaps control
48. Radio crash switch
49. Filter switch box
50. Fluorescent spotlight
51. Oxygen regulator
52. Oxygen hose
53. Flap selector
54. Undercarriage selector handle
55. Rear view mirror



Philippine veteran and ace Capt Boyd "Buzz" Wagner was seconded to the 49th PG during its Australian training period in February and March 1942. His experience was a great help given that so many of the group's pilots had joined the 49th straight from flight school. Wagner was killed in a flying accident (at the controls of P-40K 42-10271) near Eglin Field, Florida, on November 29, 1942. (Michael Claringbould)

No one was killed in these early flights, but the torque of the Allison engine proved treacherous for the novice pilots. Ground loops and swerving take-offs were common, but landing took the greater toll. More than 30 wrecks were logged in just two weeks, and groundcrews worked continuously to straighten propellers and landing gears of the pranged Warhawks. Flight surgeons patched up the bruised limbs and cracked heads of the young lieutenants from the abrupt stops after botched landings, but very few were sent to hospital.

When the pilots were ready for more advanced training, Wurtsmith was aided by the secondment of Philippine veteran Capt Boyd "Buzz" Wagner to the 49th – Wagner had recently helped form the 17th PS (Prov), but on the flip of a coin it was decided that Capt Sprague would lead it to Java. Both men pressed the importance of wingmen staying with their leaders in combat, and much formation flying was undertaken. By the end of February Wurtsmith was regularly heard coaching a tentative junior pilot with the words "squeeze it in here man, squeeze it in." Shortly thereafter, the 49th PG CO was christened "Squeeze" Wurtsmith by his men. From early March, the group routinely flew tight four-aircraft formations over the vicinity of its training bases.

Wurtsmith battled hard not to have his squadrons detached away individually on piecemeal assignments during this period. Instead, the commander stressed that to utilize the full combat potential of his group, it needed to train and fight as a unit. In this respect Wurtsmith was largely successful (with the exception of a brief 7th PS detachment to Horn Island, as detailed later in this book). Following the February 19 raid on Darwin, the 49th was earmarked for the future defense of the town. A few days later an advance team of airmen was ordered to Darwin to prepare for the assignment, flying north in an RAAF Empire flying boat.

3rd KOKUTAI

The 3rd Kokutai had originally been formed in April 1941 and equipped with G4M "Betty" bombers. Five months later it flew combat sorties into the Chinese interior from Hanoi, but the unit's association with the "Betty" was to be a short one for in mid-September it was ordered to reform as a fighter unit at Takao, on Formosa. Although the 3rd was slated to receive 54 A6M2s, plus 18 to be held in reserve, by the start of the Pacific War it was still flying a number of A5Ms due to a shortage of Zero-sens. An overall strength of 72 fighters would make the 3rd broadly comparable with the 49th PG, which would start the Darwin campaign with three squadrons each

of 25 aircraft (plus group reserves and a headquarters squadron).

The 3rd Kokutai was also assigned nine Mitsubishi C5M two-seat reconnaissance aircraft (subsequently given the Allied reporting name "Babs"). Simple to maintain and operate alongside the Zero-sens thanks to both types using the same Sakae 12 engine, C5Ms were often used as navigational guides for long-range fighter missions – these were frequently made over water.

Two A6M2s from the 12th Kokutai cruise over the cloud-shrouded Chinese mainland in May 1941. 3-138 (in the foreground) was the mount of future ace PO3c Kunimori Nakakariya, who would participate in some of the first attacks on northern Australia in March 1942 with the 3rd Kokutai. The lead fighter is 3-141, being flown here by Lt Minoru Suzuki. It displays the two fuselage bands of a chutaicho. Suzuki would later command the 202nd Kokutai during the offensive against northern Australia in 1943. (Tony Holmes collection)

Many of the pilots transferring into the 3rd Kokutai had come directly from the 12th Kokutai, which had disbanded on September 15, 1941. The 12th had a rich history of combat during the Sino-Japanese War, having been established as a mixed fighter/dive-bomber/torpedo-bomber unit in July 1937 in the wake of the China Incident. Later that year the unit re-equipped with A5M "Claudes," and in 1938 it regularly saw combat with Chinese fighters while escorting G3M "Nell" bombers.

The 12th Kokutai gained lasting fame in September 1940 when it became the first operational unit to see action with the brand new Zero-sen. Flying under the command of Lt Tamotsu Yokoyama, the fighter's unmatched range enabled pilots to fly deep escort missions that had previously been far beyond the endurance of the A5M. During one such mission on September 13, the Zero-sen engaged enemy aircraft for the first time. Thirteen A6Ms duly shot down 13 Republic of China Air Force Polikarpov I-15 and I-16 fighters over Chungking without loss – the IJNAF pilots claimed 27 destroyed.

By forming with an influx of combat-experienced pilots from the 12th Kokutai, the 3rd Kokutai could claim an illustrious lineage stretching back to both the start of the Sino-Japanese War and the combat debut of the Zero-sen. Even those pilots in the unit who had not seen combat reportedly had at least 1,000 flying hours in their logbooks. Clearly, the aviators assigned to the 3rd Kokutai were more experienced than the bulk of the recently graduated 49th PG pilots, many of whom had only commenced their P-40 training in February 1942.

Proving just how highly regarded the 3rd Kokutai was within the IJNAF, the unit was earmarked for one of the most important fighter missions undertaken at the start of the Pacific War. This involved the escort of G3M "Nell" and G4M "Betty" bombers from Formosa to Luzon, where a surprise attack was to be made on USAAC facilities there – a distance of some 500 miles. In the days leading up to the December 8, 1941 attack, the 3rd Kokutai pilots trained hard perfecting long-range flying techniques, and their expertise would soon pay large dividends. Indeed, such long-range missions quickly became the norm for the unit.

From September 1941 the 3rd Kokutai was commanded by Lt Tamotsu Yokoyama, who had led the first detachment of Zero-sens in China in July of the previous year. On December 8 Yokoyama led a strong force of 53 A6M2s (36 from the 3rd Kokutai and the rest from the Tainan Kokutai) aloft as escorts for 80 G4Ms and 27 G3Ms

A6M2 ZERO-SEN COCKPIT

1. IJNAF Type 98 reflector gunsight
2. Artificial horizon
3. Turn-and-slip indicator
4. Compass
5. IJNAF Type 97 7.7mm machine guns
6. Rate-of-climb indicator
7. Fuel pressure gauge
8. Tachometer
9. Cylinder temperature gauge
10. Oil temperature gauge
11. Intake manifold pressure gauge
12. Oil cooler shutter control handle
13. Ignition plug charger switch
14. Rudder/brake pedals
15. Oxygen control
16. Oxygen pressure gauge
17. Oxygen quantity gauge
18. Control column
19. Wing fuel tanks quantity gauge
20. Fuselage fuel tank quantity gauge
21. Switchboard
22. Fuel injection pump
23. Engine main switch
24. Radio direction indicator
25. Altimeter
26. Exhaust temperature gauge
27. Clock
28. Airspeed indicator
29. Interior lights
30. Radio homing control unit
31. Type 3 Mk 1 radio control panel
32. Arrestor hook retraction handle
33. Arrestor hook/flaps down angle indicator
34. Radio homing equipment control lever
35. Cowl gills control handle
36. Cockpit ventilation air intake
37. Seat adjustment lever
38. Seat
39. Elevator trim tab control handle
40. Machine gun safety lever
41. Throttle lever
42. Machine gun selector switch
43. Propeller pitch adjustment lever
44. Mixture control lever
45. Drop tank release lever
46. Bomb release lever
47. Switchboard
48. Flap control
49. Landing gear lever
50. Drop tank selector gauge
51. Fuselage/wing tanks switching cock
52. Wing tanks selector lever
53. Emergency gear down lever
54. High-altitude automatic mixture control

attacking Nichols and Clark Fields near Manila. The Japanese expected strong opposition, with four pursuit squadrons based in the area equipped with P-40B/Es – a fifth USAAC squadron flew worn-out P-35s.

By the time of the scheduled attack, the FEAF in the Philippines had received news of the Pearl Harbor raid. Many of the American aircraft were scrambled in expectation of an incoming raid, but nothing happened and, by midday, most of the fighters had landed to refuel. As luck would have it, the IJNAF had intended to make early morning attacks but had been delayed for several hours by heavy fog. Hence, the Japanese force arrived overhead in the early afternoon, with bombs landing on airfields amid aircraft being refueled or attempting to get airborne. Zero-sens then dived down to pick off stragglers in the air or strafe any targets they found on the ground. The mission was a great victory for the Japanese, and the 3rd Kokutai claimed eight fighters shot down and 36 aircraft destroyed on the ground, including several B-17s at Clark. Just two Zero-sens were lost in return.

Lt Cdr Takeo Shibata (center, facing pilots in his dress uniform), commanding officer of the 3rd Kokutai, salutes aviators from his unit at Takao, on the island of Formosa, after briefing them on the morning of December 8, 1941. A short while later the pilots manned their A6M2s and then took off on the IJNAF's first long-range raid on USAAC airfields in the Philippines. (Yasuho Izawa)

Two days later, on December 10, the mission was repeated with a similar degree of success for the 3rd Kokutai. Some spirited American resistance in the air resulted in a series of whirling dogfights being fought over Manila that again cost the unit two Zero-sens downed by P-40s. Several more were damaged to varying degrees, with three of the fighters force-landing at various points on the way back to Formosa. However, by the end of the day only about a quarter of the FEAF's fighters and half of its B-17s remained operational. By just the third day of the war the IJNAF had achieved a stunning victory that would enable ground forces to proceed with invasion operations as planned.

Having helped to neutralize the USAAC's fighter force on Luzon, the 3rd Kokutai redeployed to Davao, in the southern Philippines, on December 23. From this location it was able to launch deep penetration raids into the NEI. On December 26 six A6Ms flew 450 miles to Lake Tondano, in the Celebes, where they destroyed four Dornier Do 24 flying boats of the *Marine Luchtvaart Dienst* (Royal Netherlands Naval Air Service, or MLD). Two days later, a similar mission was flown some 600 miles to Tarakan, on Borneo, where four *Militaire Luchtvaart van het Koninklijk Nederlands-Indisch Leger* (Royal Netherlands East Indies Air Force, or ML-KNIL) Buffalo fighters were accounted for – three were shot down and one crash-landed.

So began a pattern of operations whereby newly captured airfields were quickly put into use by the 3rd Kokutai. This enabled strikes to be mounted against distant targets

The officer cadre from the Tainan Kokutai pose for a photograph on Jolo Island, in the Philippines, in January 1942. These men would subsequently see plenty of action over Java. In the front row, second from left, is high-scoring ace WO Gitaro Miyazaki, who claimed several P-40s destroyed in the Philippines and over Java. At the extreme right in the middle row is Lt(jg) Hideki Shingo, who was credited with a Dutch Hawk 75 and CW-21 and a USAAC B-17 and P-40 destroyed over Java, whilst in the back row, fifth from left, is high-scoring ace Lt(jg) Jun'ichi Sasai. The latter was credited with a Dutch Buffalo and three P-40s destroyed over eastern Java. (Yasuho Izawa)

that were usually not prepared for, or expecting, an attack by single-engined fighters.

On January 11, 1942, 3rd Kokutai Zero-sens downed four of five RAAF Lockheed Hudsons of No. 2 Sqn that had attempted to interfere with landing operations at Menado in the Celebes. Some 35 A6M2s were duly deployed to Menado shortly thereafter, from where they attacked Ambon (425 miles distant) and downed the two ML-KNIL Buffaloes based there. On January 23/24, Japanese forces captured Kendari, in the central Celebes. The town boasted the best airfield in the whole region, with the recently completed facility featuring long, paved, all-weather runways. The 3rd Kokutai moved here on January 25, and it was soon launching operations against Timor from Kendari.

It was this series of Japanese conquests that ended any hope of the 17th PS (Prov) flying via the NEI to reinforce the defense of the Philippines, the unit having to be sent to Java instead.

By the start of February, the bulk of the 3rd Kokutai had moved again to Balikpapan, in Borneo, from where it would escort bomber missions over Java. The scene was set for the unit's first confrontation with the P-40Es of the 17th PS (Prov).

TAINAN KOKUTAI

In the first months of the war the Tainan and 3rd Kokutais operated side by side in both the Philippines and over the NEI. Like the 3rd Kokutai, the Tainan Kokutai had also been formed as a Zero-sen unit shortly before the Pacific War commenced. It too participated in the crucial Luzon missions of December 8 and 10 from Formosa (indeed, the unit was named after Tainan airfield on Formosa). By February 1942 the Tainan Kokutai was flying regularly over Java from Balikpapan and, later, also Denpassar, from where it clashed with P-40Es from the 17th PS (Prov). In April the unit would move to New Guinea, preventing it from ever operating over Darwin.

JAMES B. MOREHEAD

Born to a mother who was part Choctaw Indian, James Morehead grew up on a farm in Oklahoma. Life was tough, especially during the Great Depression years. However, thanks to this rural upbringing, Morehead learned to shoot from a very young age – a skill to which he would later credit much of his success as a fighter pilot. While struggling to pay for a college degree, Morehead was accepted into the USAAC Flying Cadet program in 1940. He did his basic training on PT-17 Kaydet biplanes and Vultee BT-13 Valiant monoplanes. Advanced training followed in 1941 on North American AT-6 Texans, and after graduation Morehead was surprised to find that he was the only member of his class to be posted to fighters. In April 1941 he reported to the 35th PG's 21st PS at Hamilton Field, California, where he quickly gained experience flying P-36s and P-40s.

When Morehead's unit was ordered to the Philippines in November 1941, he was left behind as he was recovering from injuries sustained after bailing out of his P-40 at low level following a mid-air collision. Soon after the attack on Pearl Harbor, Morehead was among 55 pilots who boarded SS *President Polk* in San Francisco and sailed for Brisbane, arriving in mid-January 1942. While being reacquainted with the P-40, Morehead was involved in a landing accident that saw his fighter collide on the ground with another Warhawk and kill its pilot, 2Lt James Hamilton.

Morehead was posted to the 20th PS (Prov) a short while later, and on January 29 the unit departed Amberley for Java, via Darwin. He described the leg from Darwin to Timor, flown in torrential rain, as the "worst flight of my life." During a refueling stop on Bali the squadron was mauled by Zero-sens. With his fighter still to be refueled, Morehead bravely taxied his P-40 to a safe dispersal. The following day he was ordered to escort a Beech Model 18 to Soerabaja, and he ensured it landed safely, despite attention from enemy aircraft. Morehead subsequently flew several combat missions over Java with the 17th PS (Prov), including on February 23 when he made a lone attack on a formation of bombers and claimed two of them destroyed.

After being evacuated from Java via Broome in a B-17, Morehead joined the 8th PS/49th PG, where his experience was most welcome – he was made a flight leader. On April 25, 1942, Morehead contributed to the downing of four G4Ms when his squadron was able to close on an IJNAF bomber formation caught at medium altitude with its Zero-sen escorts busy elsewhere. Months later on August 23, during the final engagement fought by the 49th FG over Darwin, Morehead likely accounted for at least one of four Zero-sens that were shot down. In between raids Morehead was a keen hunter and fisherman, bagging much fresh game and fish that added welcome variety to his unit's mostly tinned food rations.

Morehead was disappointed to miss the opportunity to fly Lockheed P-38 Lightnings with the 49th FG in New Guinea, being posted back to the US in September 1942 at the end of his tour. Having spent all of 1943 commanding a Lightning squadron being prepared for combat, he was posted to the P-38-equipped 71st FS/1st FG in Italy in March 1944, where he completed his second operational tour of duty – Morehead claimed a Bf 109 destroyed on June 6, to take his final tally to eight victories and one damaged.

Remaining in the USAF Reserve post-war, he saw further active service flying F-84 Thunderjets in the Korean War. Finally retiring in 1967, Morehead prospered as a Californian real estate developer. He passed away on March 11, 2012.

1Lt James B. Morehead. (NARA)

YOSHIRO HASHIGUCHI

Born in the city of Fukuoka in 1918, Yoshiro Hashiguchi joined the IJN in 1937 and subsequently graduated from the 42nd Pilot Training Class in September 1938. Following brief service with the Saeki, Oita and Ohmura Kokutais, he joined the 12th Kokutai in central China in June 1939. Hashiguchi was wounded in a Chinese bombing raid four months later, and he was forced to return to Japan to recuperate. In January 1940 he was posted to the Suzuka Kokutai as an instructor, where he remained until transferred to the 3rd Kokutai in November 1941.

Hashiguchi participated in both of the long-range Luzon missions on December 8 and 10, and he subsequently saw considerable combat over the Philippines and the NEI. He was shot in the right thigh during a strafing attack on a radio station on February 9, 1942, although he had recovered enough by March 3 to take his place in the third shotai during the ultra-long-range raid on Broome, where he strafed moored flying boats. Hashiguchi played an active role in many of the 3rd Kokutai's Darwin missions until part of the unit was posted to Rabaul in September 1942. For the next two months he was involved in combat over Guadalcanal, with his shotai claiming five aircraft shot down and two more as probables on October 18.

On November 1 the 3rd Kokutai became the 202nd Kokutai and the Rabaul detachment returned to Kendari shortly thereafter. Hashiguchi again saw further combat over Darwin in the first six months of 1943, regularly clashing with the RAAF's Spitfire-equipped No. 1 Fighter Wing. Flying as a wingman to various hikotaicho, Hashiguchi was eventually posted back to Japan to join the Oita Kokutai in June 1943. In December of that year he undertook flying training on board the aircraft carrier *Shokaku* prior to joining the vessel's 601st Kokutai as its senior NCO pilot.

Having survived the disastrous Operation *A-Go* (Battle of the Philippine Sea) in June 1944, Hashiguchi was posted to the 653rd Kokutai the following month. His unit was duly ordered to participate in Operation *Sho-Go* (Battle of Leyte Gulf) in late October, with pilots being sent to Okinawa via land bases. However, when his Zero-sen suffered mechanical problems en route, Hashiguchi embarked in the carrier *Chiyoda* instead. He completed a number of missions from the vessel during the Battle of Cape Egano on October 25, prior to the carrier being sunk by US Navy aircraft later that same day. Hashiguchi was subsequently posted as missing, presumed killed, by which time he had been credited with more than ten victories.

FP03c Yoshiro Hashiguchi. (Yasuho Izawa)

COMBAT

JAVA

On January 24, 1943, the first flight of Capt Sprague's 17th PS (Prov) arrived at Tandjoeng Perak in Soerabaja. The latter was a large industrial city in eastern Java that was also the site of a major Dutch naval base which included the MLD facility at Morokrembangan. Eastern Java was also home to the inland airfield of Singosari, near Malang, where USAAC B-17 and LB-30 heavy bombers of the 7th and 19th Bombardment Groups were based. Both the naval base and the American heavy bombers were critical assets to any defense of Java, and this in turn made them high priority targets for the Japanese.

The 17th shared Tandjoeng Perak with 13 Curtiss-Wright CW-21B Demons of the ML-KNIL's 2-VlG-IV. Another fighter unit, 1-VlG-IV, was equipped with seven Hawk 75A-7s at Maospati, southwest of Tandjoeng Perak near Madioen.

By then the IJNAF had occupied Kendari. From this location they would threaten Penfui and jeopardize the tenuous air route the 17th PS (Prov) had followed to reach Java. However, Kendari was 700 miles from Soerabaja, and for the time being east Java was safe from attack. This gave Sprague a brief period of time in which to organize his operations. The first priority was to establish an

Curtiss-Wright CW-21B Demons of the ML-KNIL's 2-VIG-IV. The 17th PS (Prov) shared Tandjoeng Perak with the latter unit when it initially reached Java in late January 1942. Just 24 Demons were supplied to the ML-KNIL in February 1941, and pilots from 2-VIG-IV claimed four aerial victories with the aircraft before they were either shot down by Zero-sens or destroyed on the ground during bombing raids on Tandjoeng Perak. (Thijs Postma)

operating airfield away from Tandjoeng Perak, which, being a base known to the enemy, would soon be targeted.

Sprague choose Ngoro, a small airstrip 40 miles southwest of Soerabaja. Here, the Dutch had constructed a T-shaped runway that the Americans described as a "masterpiece of camouflage." From the air the location appeared to be a string of rice paddies, criss-crossed by irrigation ditches and complete with a dummy road winding across the entire location. At first the Warhawk pilots needed considerable assistance to find Ngoro from the air. It would remain unknown to the Japanese for much of the upcoming campaign.

While Ngoro was being made ready for the 17th PS (Prov), its pilots flew patrols and familiarization flights with Dutch fighters from Perak. The northern side of Java was generally flat and covered with rice paddies and villages, while the southern side was mountainous. Sprague was disappointed to learn there was no radar coverage. Instead, his squadron would have to rely on warnings from a network of ground spotters.

On February 1 ten P-40s were flown from Perak into Ngoro. Meanwhile, in the last week of January, Japanese forces had captured the oil-producing center of Balikpapan, on Borneo. This was just 500 miles to the north of Soerabaja, putting eastern Java within range of IJNAF fighter-escorted bombers for the first time. True to established tactics, the Japanese were quick to make use of the Dutch airfield at Balikpapan, with elements of the 3rd and Tainan Kokutais moving in before the end of January. The first offensive mission over eastern Java was flown by 17 Tainan Kokutai Zero-sens from Balikpapan on February 2. After arriving over the north coast of Java just after midday, the A6M2s downed a USAAC Douglas B-18 Bolo bomber that was being used as a transport. Among those on board who were lost was an USAAC radar expert and the newly appointed commanding officer of the 7th Bombardment Group. The Zero-sens then swept down to strafe the Dutch fighter base at Maospati, were they claimed two small aircraft destroyed.

The first big raid on eastern Java took place the following day when three separate groups of G3M "Nells" and G4M "Bettys," totaling some 72 bombers, targeted Soerabaja, Maospati and Singosari. The bombers were to be escorted by 17 Tainan Kokutai Zero-sens and an impressive force of 27 A6M2s from the 3rd Kokutai led by Lt Tamotsu Yokoyama. Advanced warning was received of this large force of intruders, and this enabled the scrambling of all seven Hawks from Maospati and 12 CW-21Bs from Perak. Many of the Dutch pilots were highly skilled, and in some ways their fast-climbing and lightweight CW-21Bs were not dissimilar to the Zero-sens they would fight. Both the CW-21Bs and Hawks dated from the 1930s, however, and were lacking in performance compared to the more modern A6M2s.

When attempting to engage battle-hardened veterans with the twin advantages of superior altitude and numbers, the ML-KNIL pilots stood little chance. Over Maospati, the Hawks were able to fire on an escorted formation of "Nells" before Zero-sens intervened. In the ensuing combat, five of the Dutch fighters were lost. Meanwhile, in a swirling dogfight over Soerabaja, four CW-21Bs were also downed – only one pilot managed to bail out, the remaining three being killed. At least four more CW-21Bs made emergency landings after being damaged. However, the Dutch pilots had fought back in a spirited fashion and were able to bring fire to bear on their attackers on a number of occasions. Indeed, in this combat the 3rd Kokutai

A6M2 X-121 of the 3rd Kokutai under protective tarpaulins at Kendari, in the central Celebes, in mid-1942. Captured by Japanese forces on January 23/24, 1942, the former ML-KNIL base was the best airfield in the whole region thanks to it boasting recently paved all-weather runways. The 3rd Kokutai moved here on January 25, and it would remain the unit's principal home for more than 18 months (by which time it had become the 202nd Kokutai). (Author)

lost three Zero-sens, with pilots FPO2c Hatsumasa Yamaya and FPO3cs Sho-ichi Shoji and Masaru Morita being killed.

During or soon after these clashes, the remaining Zero-sens were able to mount strafing attacks on ground targets that inflicted considerable damage in conjunction with the bombs dropped by the "Nells." At Morokrembangan, 3rd Kokutai pilots found easy targets among moored MLD flying boats and floatplanes. Others were shot down in the air, some of which were caught unawares while on training flights. At Singosari, Tainan Kokutai Zero-sens also found prime targets in the form of B-17s on the ground that were bombed-up and ready for take-off. Four of these were hit and subsequently burnt out after their ordnance exploded.

At Ngoro, the 17th PS (Prov) received news of the raid after the Dutch fighter units had been alerted, and seven P-40Es that were on standby were immediately launched. As Sprague was absent from Ngoro that morning, the fighters were led by Philippine veteran 1Lt Walter Coss. The Americans headed for Soerabaja while climbing as quickly as they could in their heavy machines. Four of the P-40s subsequently spotted a formation of "Nells" 4,000ft above them flying north after dropping their bombs. By the time the Warhawks were in a position to attack, the G3Ms had closed up into two tight echelon formations that maximized their defensive firepower. Worried about their dwindling supply of fuel, the USAAC pilots managed only a few ineffective firing passes while 85 miles out to sea before turning back to base.

Meanwhile, a trio of P-40s led by Coss had chased a separate group of "Nells" retiring north after raiding Singosari. They too labored to reach the IJNAF bombers as they headed home at an altitude of 20,000ft, and while they were still a few thousand feet below them, the P-40Es were bounced by Zero-sens from the 3rd Kokutai. Coss responded by turning into and firing at the attackers before leading his two wingmen in a dive to escape. However, after re-climbing, the American pilots were attacked once more by A6M2s out of the sun. Coss again turned into and fired at the attackers, but on this occasion excellent Japanese marksmanship resulted in one of his wingmen, 2Lt James Rowland, being shot down and killed.

Coss, however, had once again used the weight of his fighter to his advantage and successfully dived away from his opponents. Having turned back for Ngoro, Coss was

flying at 10,000ft when he spotted a formation of Tainan Kokutai Zero-sens below him that were heading home after strafing Singosari. He dived on the trailing machine and, after firing on it, saw the fighter explode in mid-air. Coss's victim was NA1c Kyoji Kobayashi.

On February 5 the IJNAF again launched a major offensive operation in the form of a fighter sweep. At 0820 hrs 27 Tainan Kokutai Zero-sens headed for Soerabaja, followed an hour later by 11 fighters from the 3rd Kokutai. Finally, ten more A6M2s from the latter unit headed for Denpassar. Over Java, the four remaining CW-21Bs and two Hawks rose to meet the Tainan Kokutai. Two of the CW-21Bs were badly shot up and made emergency landings, with Zero-sens also engaging six B-17s heading out to attack Japanese vessels in the port at Balikpapan. One of the bombers was damaged and the attack was called off. Thirty minutes later, the smaller 3rd Kokutai formation reached Soerabaja and engaged the two remaining Hawks, both of which were downed.

A C-53 and a B-24A (full of 20th PS (Prov) groundcrew) on supply flights from Australia landed at Perak soon after these engagements had taken place, both aircraft being very fortunate to have escaped the attentions of the Zero-sens.

Meanwhile, eight P-40Es had been scrambled following a report of incoming bombers. As they neared Soerabaja at an altitude of 22,000ft, pilots scanned the skies for the enemy, but nothing was sighted. Returning to Ngoro at 1130 hrs, they learned that the "Japanese bombers" had in fact been the B-17s that had abandoned their mission after running into the Tainan Kokutai.

The ten Zero-sens from the 3rd Kokutai that had targeted Denpassar caught 12 P-40Es of the 20th PS (Prov) in the midst of a refueling stop *en route* to Java. As noted in the previous chapter, five Warhawks were shot down and two destroyed on the ground. Just three P-40Es reached Perak, and they were subsequently incorporated into the 17th PS (Prov) at Ngoro, as were a handful of repaired machines.

That evening (February 5), a second contingent of ten Warhawks from the 20th PS (Prov) landed at Penfui, trailing the earlier contingent by 24 hours. At dawn the

Three Hawk 75A-7s of the ML-KNIL's 1-VIG-IV patrol over eastern Java in late 1941. This unit was equipped with seven such fighters at Maospati, southwest of Tandjoeng Perak during the ill-fated defense of Java. The Hawk 75A-7s closest to the camera (C325 and C332) were both shot down by Zero-sens from the 3rd Kokutai over Soerabaja on February 5, 1942. (Thijs Postma)

following morning the fighters took off for Java, joined by an eleventh machine from an earlier group and following a Beech Model 18 that was acting as a guide aircraft. About halfway to their refueling stop the American pilots noticed a strange twin-engined aircraft they identified as a "Messerschmitt 110." This was in fact a G3M "Nell" of the 1st Kokutai that had spotted the Beech Model 18 and was now about to attack it. Several of the fighter pilots intervened, and at least three (2Lts Robert McWherter, Hubert Egenes and future ace Andrew Reynolds) scored hits before the bomber crashed into the ocean. However, the victory came at a cost. As a result of dropping their belly tanks at the start of the combat, two P-40Es were unable to reach Denpassar and instead force-landed on Lombok. The remaining nine fighters made it to Perak later that day, where they were welcome further additions to the ranks of the 17th PS (Prov).

PO2c Susumi Isihara of the Tainan Kokutai claimed several P-40 victories over the Philippines and Java prior to being posted back to Japan to serve as an instructor in April 1942. He returned to action in June 1943, flying from Rabaul, Truk and Yap, before going back to Japan to help with the defense of Kure and Osaka. Isihara survived the war with 16 confirmed victories to his name. (Yasuho Izawa)

On February 9 a Japanese convoy landed troops at Macassar in the southwestern Celebes. Zero-sens of the 3rd Kokutai provided cover and strafed ground targets. During attacks on an armored car, FPO1c Masayuki Nakase was hit by return fire and killed. One of the top-scoring aces of the unit and an early user of the A6M2 in China, Nakase had claimed 18 victories prior to his death. The Macassar mission was one of the relatively few occasions that the unarmored Zero-sen was used for a direct attack on ground forces.

This day also saw aerial combat over eastern Java, with 16 P-40Es being scrambled in order to intercept a formation of 18 bombers detected making for nearby Singosari. Given the time needed to reach the attackers' altitude, the fighters were directed to the vicinity of Soerabaja in the hope of catching the IJNAF aircraft on their return flight. However, after their prolonged climb, the P-40E pilots reached their assigned height of 23,000ft in isolated elements over a wide area. Several pilots spotted the enemy formation and labored to make contact, the Warhawks only having a slight speed advantage at that altitude. A few independent attacks were managed as the bombers flew towards Madoera Island, to the north of Soerabaja.

For some of the American pilots, this was the first time they had employed their guns in anger, and they likely fired at too great a range. Recently arrived 20th PS (Prov) pilot 2Lt Jesse "Butch" Hague admitted that he had "wobbled his fire all over the sky." The only claimed damage was inflicted by Bob McWherter, who believed he had hit an engine on a "Type 96" ("Nell") bomber, causing it to smoke.

The next few days (February 10–12) saw bad weather prevent further Japanese activity over eastern Java, although Sprague's pilots were up in the air each day in anticipation of raids. During this period the last P-40Es to reach the 17th PS (Prov) arrived when a flight of nine aircraft from the 3rd PS (Prov) was led in by the squadron's commanding officer, and future ace, Capt Grant Mahony. With

the addition of these fighters on February 11, Sprague now had 30 P-40Es available for operations and a few more awaiting repair. The following day an impressive 24 Warhawks were in the air flying protective patrols over the B-17 base at Singosari. During this period the few remaining Dutch fighters were withdrawn to central and western Java, leaving the air defense of the east entirely in the hands of the 17th PS (Prov).

The lull in Japanese activity masked preparations for further offensive operations that would see Java isolated. On February 15 British and Commonwealth forces defending Singapore surrendered, while Allied troops in the NEI desperately tried to repel Japanese intrusions into nearby Sumatra. To this end Sprague received orders from ABDACOM headquarters to organize an attack against shipping and landing craft in the Moesi delta, near the oil-producing center of Palembang. Subsequently, Sprague led eight bomb-equipped P-40Es (that were temporarily based at Batavia) on a successful sweep of the area, where a single Nakajima Ki-27 "Nate" fighter of the IJAAF's 11th Sentai was shot down and barges strafed.

While the eight-strong Batavia detachment had been away, an attempt had been made to improve the ground control system in eastern Java. Maj Bill Fisher, a B-17 pilot and former commander of the 28th Bombardment Squadron (BS) in the Philippines, was sent to Soerabaja, where he amicably took over control of the local Air Defense Command from the Dutch. Fisher sought to know the whereabouts of friendly aircraft to avoid confusion, amid other efficiencies. However, without any radar coverage, the best he could do was give the 17th PS (Prov) a 30-minute warning of an impending attack. Frustratingly for the P-40 pilots, they needed 40 minutes to climb to the high altitudes favored by the IJNAF bombers.

On February 18 Fisher sent his first warning of a Japanese raid (Sprague's eight Warhawks had returned from the Palembang mission that morning), the intruders being 21 G4Ms of the Kendari-based Takao Kokutai and their eight Zero-sen escorts from the Tainan Kokutai. A chutai of nine "Bettys" became separated from their escorts and approached the target area alone. On this occasion Fisher's warning had been adequate, and 12 P-40Es managed to climb to 26,000ft over Soerabaja. The USAAC pilots spotted the chutai 4,000ft below them, presenting the 17th PS (Prov) with a perfect target.

Almost an ace, FP02c Yoshisuke Arita of the Tainan Kokutai is seen here with A6M2 V-141 *Houkoku-439* at Denpassar airfield on the island of Bali in March 1942. He claimed three and one shared victories (including a P-40 on February 18, 1942) prior to being killed in action over New Guinea on May 1, 1942. (Yasuho Izawa)

As the bombers made their run against shipping in the harbor below, one of them took a direct hit from antiaircraft fire and was destroyed. Moments later the surviving G4Ms were attacked by the P-40Es, and two more bombers were shot down and another ditched on its return flight after being severely damage. Nine others from the main formation were also hit but managed to limp back to Kendari. The jubilant Warhawk pilots believed they had brought down at least four bombers – a claim that was not too far from the truth. One P-40E was hit by return fire from the "Bettys," forcing

2Lt Morris Caldwell to bail out. After the initial attacking passes by the USAAC fighters the Zero-sen escorts intervened and chased them away.

Despite the P-40s' successful attack, the Japanese bombing was deadly accurate. The veteran Dutch cruiser *Soerabaja*, a submarine and some smaller vessels were sunk in the harbor.

On February 19 the IJNAF despatched 18 bombers (escorted by 23 Tainan Kokutai Zero-sens) against Soerabaja. In response, 16 P-40Es led by Philippine veteran Capt Grant Mahony were scrambled following a warning by Maj Bill Fisher. While still 100 miles north of Soerabaja, the bombers attacked the alternate target of Bawean Island, leaving the A6M2s to continue with a fighter sweep. Unfortunately for the four USAAC flights, they arrived over Soerabaja beneath the Zero-sens, and the latter, freed from the responsibility of protecting any bombers, pressed their attacks home to maximum advantage. Eight of the P-40Es were targeted, and these turned upwards and into the Japanese fighters. Two Warhawks quickly fell to accurate enemy fire, with 2Lt Ed Gilmore managing to bail out. 2Lt Quanah Fields, of Cherokee Indian heritage, was killed, however.

NAP1c Saburo Sakai of the Tainan Kokutai claimed a number of Dutch and USAAC aircraft (including two P-40s on February 19, 1942) shot down over Java. He duly became one of the most famous Zero-sen aces known in the West post-war as a result of the biography *Samurai!*, published in English in 1957 and written by Martin Caidin based on interviews with Sakai by Fred Saito. Sakai has been credited with 64 victories, although it has been asserted that only 28 of these are officially recorded. (Yasuho Izawa)

2Lt Cy Blanton enjoyed more success. As he too had turned upwards and into the Japanese attack, his opponent pulled up sharply to avoid a collision. This presented Blanton with an easy target, and after he poured fire into the Zero-sen it exploded. His victim was Lt Masao Asai, whose sudden loss was witnessed by famous ace NAP1c Saburo Sakai:

> A Zero with two blue stripes across the fuselage passed 200 yards in front of my plane. Without warning the Zero exploded in a vivid blast of fire, killing Lt Masao Asai, our squadron commander. To this day I do not know what caused the explosion.

A USAAC Douglas A-24 Banshee dive-bomber (effectively a de-navalized SBD Dauntless) under assembly at Archerfield in early 1942. A handful of A-24s of the 91st BS reached Java and flew a number of missions, including against shipping off Bali on February 20 when the 17th PS (Prov) commanding officer, Capt Charles Sprague, was shot down by a Zero-sen of the 3rd Kokutai. (Australian War Memorial)

PREVIOUS PAGE
By February 20, 1942, Japanese troops had landed on both Bali and Timor, severing the air route between Darwin and Java and leaving the latter isolated. IJN vessels off Bali supporting the invasion offered a prime target for USAAC aircraft on Java, and on this day seven A-24 Banshee dive-bombers from the 91st BS were launched with a strong escort of 16 P-40Es from the 17th PS (Prov). On approaching the target at 14,000ft, and just as the final three A-24 pilots began pushing over in their dives, the formation was bounced from above by Zero-sens of the 3rd Kokutai. In the brief action that ensued, four P-40Es were lost (and a fifth so badly shot up it crash-landed back at Ngoro) and the CO of the 17th PS (Prov), Capt Charles Sprague, killed. None of the A-24s fell to the Zero-sens, however.

Far to the southeast, February 19 also saw the devastating raid on Darwin by aircraft from four IJN fleet carriers. As previously explained in this book, nine P-40Es from the 33rd PS (Prov) were destroyed in the attack, which had been launched in support of the Timor invasion convoy – the latter landed its troops that night. With the successful occupation of both Bali and Timor well under way, the isolation of Java was complete.

Meanwhile, Japanese shipping off Bali presented tempting targets for American bombers, with an attack being planned for February 20. The 17th PS (Prov) was tasked with providing an escort for the bombers, and at dawn Sprague duly led 16 P-40Es to Singosari, where they met seven Douglas A-24 Banshee dive-bombers of the 91st BS right on schedule, as well as three LB-30s. They made the 200-mile flight to Bali in bright, clear, weather, Sprague arranging his four flights in a defensive box formation around the dive-bombers as they approached the target area at 14,000ft. However, the Warhawk pilots, probably distracted as they watched the A-24s make their diving attacks on the shipping below, failed to spot Zero-sens high above them. They would pay dearly for their mistake.

The A6M2s were from the 3rd Kokutai, with two sections flying a defensive patrol over vessels off Bali. They attacked just as the last three A-24s were pushing over into their dives. Future aces SEA1cs Yoshinao Tokuji and Masao Masuyama targeted the P-40Es and Sprague and 2Lt Wilfred Galliere were shot down. Sprague was killed and Galliere bailed out and became a PoW. 2Lt Thomas Hayes was wounded when his Warhawk was badly shot up, although he survived a crash-landing at Ngoro. Two other pilots ran short of fuel on their way home and made belly landings on Java. The 17th PS (Prov) had suffered the loss of five P-40Es and their commanding officer (all claimed by Tokuji and Masuyama). In return, future ace 1Lt Joe Kruzel was presented with an opportunistic target during the combat, and he duly shot down the Zero-sen flown by SEA1c Tomekichi Otsuki.

With Bali captured, detachments from the 3rd and Tainan Kokutais were quick to move into the newly occupied Denpassar airfield. Meanwhile, the loss of Sprague badly affected the morale of the 17th PS (Prov), and the remaining pilots worried they would soon be making their own futile sacrifices as an expendable force now that Java was isolated. Newly arrived former 20th PS (Prov) pilot 2Lt James Morehead recalled:

> The morale of the 17th PS was not high when I joined it. It was bouncing on the bottom after the Bali raid. Where an alert shack normally is boisterous with laughter and wise-cracks, silent anxiety was the mood in those days.

Nevertheless, operations continued at a high tempo on February 21, when 16 P-40Es were once again scrambled. These were led aloft by Capt Mahony, who was now the highest ranked pilot in the unit following Sprague's loss. The P-40Es arrived over Soerabaja at 21,000ft to find 21 G4Ms from the Takao Kokutai at a similar height after they had bombed the harbor. As two flights of P-40Es began attacking passes at the "Bettys," 12 Zero-sens from the Denpassar detachments intervened from above. 2Lts George Hynes and Wallace Hoskyn were both shot down and killed. In return the Japanese suffered no losses, although one G4M sustained hits.

With these losses, the mood of the American pilots darkened further. 2Lt George Parker wrote in his diary, "We are desperate. How can we operate against such odds?"

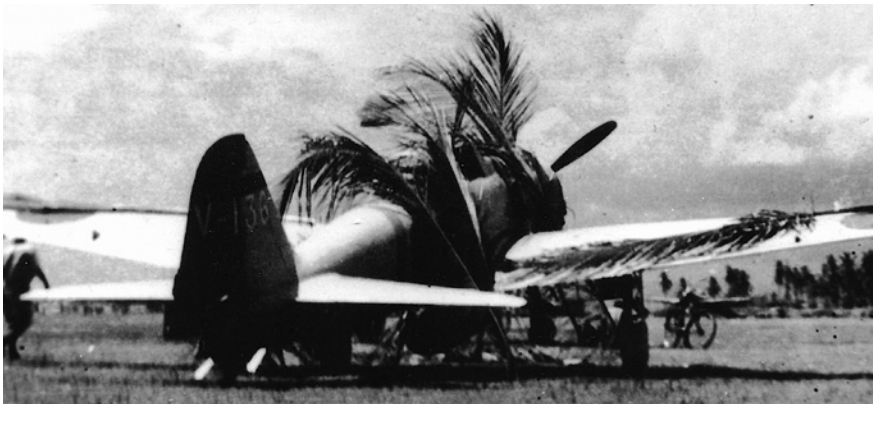
On the morning of February 23, 12 P-40Es climbed to 22,000ft over Singosari, where A and B Flights met a formation of nine incoming G4M "Bettys." Seven fighters managed passes at the bombers before nine escorting Zero-sens from the Tainan Kokutai intervened and drove them off. Despite claims by both sides, there were no losses in this skirmish.

Following the recent high attrition amongst its P-40s, the 17th PS (Prov) now had far more pilots than aircraft. So, on February 23, 56 pilots and groundcrew joined large groups of USAAC personnel being evacuated from Java. Among those leaving was Mahony, who was replaced as CO of the 17th PS (Prov) by Gerald "Bo" McCallum, who had just received a promotion to captain.

SEA1c Masao Masuyama was one of the 3rd Kokutai pilots who shot down Capt Charles Sprague and his wingman, 2Lt Wilfred Galliere, off Bali on February 20. Masuyama flew in combat with the unit for 16 months from December 1941, seeing action over the Philippines, the NEI and northern Australia. He had been credited with 17 victories (including a number of ML-KNIL fighters) by the time he returned to Japan to become a test pilot in April 1943. (Yasuho Izawa)

February 24 saw a large raid on eastern Java by 33 bombers, which targeted ships in Soerabaja harbor and the B-17 base at Singosari. Once again three flights of P-40Es were scrambled, but with their engines now increasingly worn, only one flight was able to briefly attack the bombers as they retired to the north. A mixed bag of nine A6M2s from the 3rd and Tainan Kokutais was providing escort, and these dived on the Warhawks from above. A number of USAAC fighters were badly shot up, although all were able to land safely at Ngoro. The next day saw an almost identical repeat of events when 12 P-40Es scrambled to meet incoming bombers over Soerabaja. These were 22 G4Ms from the Takao Kokutai, escorted by nine Tainan Kokutai Zero-sens that once again pounced on the P-40Es from above. In the ensuing combat "Bo" McCallum's fighter was seen to be hit and he bailed out. His bullet-riddled body was later recovered, McCullum having been shot through the head and heart while hanging beneath his parachute. After the loss of yet another commanding officer, Ed Kiser became the new acting CO.

Joining the Americans at Ngoro on February 26 were six ML-KNIL Buffaloes and six Hurricanes passed on to the Dutch by the RAF. That same day, 12 P-40Es and



Crudely camouflaged with palm fronds, this A6M2 from the Tainan Kokutai was photographed at Denpassar, on Bali, during the spring of 1942. Detachments of Zero-sens from both the Tainan and 3rd Kokutais quickly occupied the airfield following its capture in late February. Like most Tainan Kokutai A6M2s, this aircraft has had its aerial mast and near-useless radio (due to interference from unshielded spark plugs fitted to the engine) removed to save weight. (Yauho Izawa)

three Buffaloes were scrambled to intercept an incoming raid. The intruders were 26 "Bettys" targeting the naval base at Soerabaja, the bombers being escorted by eight Zero-sens. This time none of the tired Allied fighters could climb higher than 26,000ft, with the bombers and their escorts up at around 30,000ft. When the A6M2s dived at the P-40Es and Buffaloes, the latter successfully fled for Ngoro.

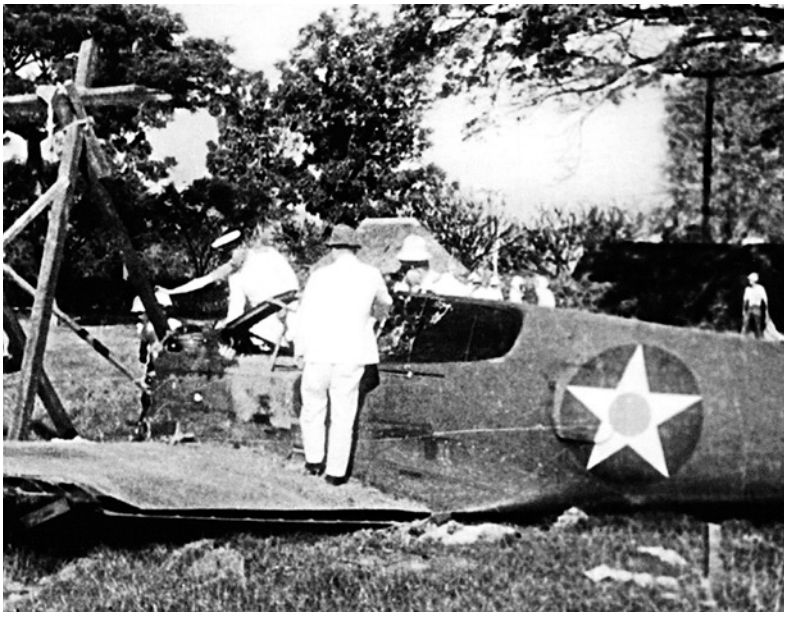
The repetitive nature of the missions, with little chance of success, was now weighing heavily on the remaining pilots. A dispirited 2Lt Spence Johnson wrote in his diary:

> Every day a nightmare! More raids, more Japs, never ceasing air raids. Half our outfit left or killed and no planes coming. We are encircled and terribly outnumbered!

By then the Japanese invasion convoys were approaching Java from both the east and west, and Allied cruisers attempted to engage the vessels on February 27 in what became known as the Battle of the Java Sea. The ABDACOM force was soundly defeated, resulting in the deaths of more than 2,300 sailors and the loss of five vessels (the IJN lost no ships and had 36 sailors killed). Japanese forces started coming ashore the following night.

On February 27 ten P-40Es, led by Kiser, had been called on to escort the three remaining A-24s in an attack against the invasion force. After the Banshees had dropped their bombs, the Warhawks remained in the area providing air cover to the Allied cruisers and destroyers participating in the Battle of the Java Sea. The pilots had a grandstand view of the naval engagement raging below them, although they did not encounter any enemy aircraft.

During the early hours of March 1, the Japanese invasion force came ashore 90 miles west of Soerabaja. By now, arrangements were under way for the evacuation of all remaining USAAC personnel from Java. However, the Dutch wanted the 17th PS (Prov) to attack the landing force. Kiser assembled his last ten airworthy P-40Es and led them off at dawn with six Buffaloes and six Hurricanes. Some of the American pilots regarded it as a foolish suicide mission. The mixed formation approached the landing beach from the east so as to make their low-level attack with the sun behind them. They saw a beachhead crammed with troops and supplies that had been offloaded from an array of barges and small craft.



A crash-landed P-40E from the 17th PS (Prov) is examined by Japanese troops shortly after the surrender of Java in March 1942. The wooden jig ahead of the aircraft would have been used in the removal of the Warhawk's Allison engine. (Bob Alford)

The attackers ran into a barrage of antiaircraft fire from both shore positions and the nearby ships. Three P-40Es were quickly lost,

with 2Lts Morris Caldwell and Cornelius Reagan being killed. 2Lt Frank Adkins bailed out near the beach and was lucky to evade the Japanese – he rode to safety on a bicycle he shared with a local Javanese man.

After the surviving seven P-40Es had returned to Ngoro, the remaining personnel from the 17th PS (Prov) received the welcome news that they would be evacuated. The only thing left to do was to hand over the last aircraft and supplies to the Dutch. This process was interrupted at around 0900 hrs with the sudden appearance of four Tainan Kokutai Zero-sens overhead – the IJNAF had finally discovered the hidden airfield. While two fighters remained at medium altitude to provide cover, NAP1c Yoshimichi Saeki led his wingman down to strafe Ngoro. A US report on the attack read as follows:

> With no opposition of any sort to hinder them, the two Jap pilots ranged back and forth till they had hunted out and destroyed every one of the parked aircraft.

The airfield defenses had just been withdrawn following receipt of the order to pull out, allowing Saeki and his wingman to claim one twin-engined aircraft burnt out and ten fighters destroyed or damaged. All ten P-40s were indeed either destroyed or severely damaged, with two LB-30s also being damaged beyond repair. Two Dutch Hurricanes and five Glenn Martin Model 166 bombers were destroyed too.

So ended the air campaign in Java. Fortunately for the surviving personnel of the 17th PS (Prov), ABDACOM had foreseen the need to evacuate the island. The largest contingent of airmen embarked on the Dutch freighter MS *Abbekerk*, which sailed from Java on February 27 and reached Fremantle several days later. Many others, including the final contingent from the 17th PS (Prov), were flown out via an aerial evacuation route between Java and Broome.

AUSTRALIA

Well before the Japanese capture of Bali and Timor on February 19-20, there had been concerns about the security of the air route between Darwin and Timor. On January 30, Zero-sens of the 3rd Kokutai flying from Kendari had shot down the unarmed Qantas Empire flying boat *Corio* over Timor. It was clear that a more southerly route was needed that was beyond the range of Japanese fighters. The obvious waypoint on the Western Australian coast was the isolated pearling port of Broome, even though it was situated some 1,000 miles from eastern Java.

Urgent work was undertaken to provide Broome with the ability to service flying boats – this took the form of laying moorings in nearby Roebuck Bay and installing refueling facilities. The first Qantas flying boat arrived from Java on February 8. At the same time parallel measures were being taken to explore the route for land-based aircraft, and a KNILM DC-3 had flown the first proving flight from Java to the airfield at Broome without incident four days earlier. Within a short time the port town's runway had been upgraded to handle fully laden B-17s, LB-30s and B-24As, and by the last week of February it was the principal destination for the USAAC evacuation of Java. By the time of the Java landings on March 1, a continuous shuttle

Lt Zenjiro Miyano was a leading ace of the 3rd Kokutai, and he also served as a senior chutaicho within the unit. Eventually credited with 16 victories, he led the long-range attack on Broome on March 3, 1942, shooting down KNILM DC-3 PK-AFV. Miyano pioneered the transition from three- to four-aircraft shotai, the latter consisting of tactical pairs, and fought in the Solomons campaign with the 6th (later the 204th) Kokutai until his death in action on June 16, 1943. (Yasuho Izawa)

of widely varying aircraft types was using the field, many making their flights overnight. These included KNILM DC-2, DC-3 and DC-5 airliners and ML-KNIL Lockheed Lodestar transports. They were joined by a variety of Dutch, British and American Catalina and Dornier flying boats.

At this time the 3rd Kokutai started using Penfui as a forward operating base. On March 2 a C5M was sent to reconnoitre Broome, which it photographed when the aircraft flew unopposed (there were no antiaircraft defenses of any kind at this remote location) over the port town during the middle of the day. The 3rd Kokutai followed this flight up with a long-range attack by a single chutai of nine Zero-sens just 24 hours later. The plan was bold and risky, and involved a long over-water flight of some 600 miles – further than the Formosa–Luzon missions of December 1941.

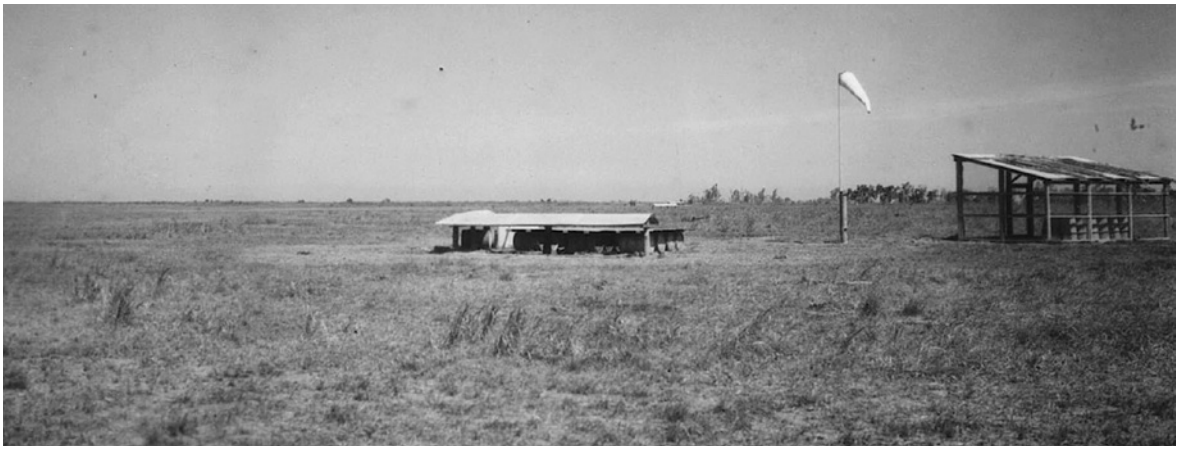
The attack, led by ace Lt Zenjiro Miyano, was brilliantly executed and caught many aircraft at Broome airfield and flying boats tied up to moorings in Roebuck Bay. No fewer than 23 valuable multi-engined transports were destroyed and more than 80 passengers (including Dutch women and children) and crew were killed. It was not an entirely one-sided fight, however, as WO Osamu Kudo also perished when his fighter was almost certainly shot down by a tail gunner from a B-24A that he in turn destroyed moments prior to his own demise. A second Zero-sen ditched during the return leg of the mission due to fuel starvation, although its pilot was rescued.

On March 4 the 3rd Kokutai made the first of many appearances over Darwin when a chutai of nine Zero-sens, under the command of Lt Ichiro Mukai, was guided to the town by a C5M. The fighters strafed the battered RAAF base, where they destroyed a single Hudson. There were no Allied fighters present at that time, although Darwin now boasted 18 3.7-in. antiaircraft guns backed up by a similar number of searchlights.

Four days later, the remaining Allied troops on Java surrendered and Broome no longer had any strategic significance. Indeed, ABDACOM had ordered most of the remaining evacuation flights to land further south at Port Hedland following the March 3 Broome raid. The final such flight took place on the 6th.

Meanwhile, as explained earlier in this volume, the 49th PG had by now been earmarked for service in the defense of Darwin. However, while Lt Col Wurtsmith was fortunate enough to have three experienced squadron leaders in Capts Robert Morrissey (7th PS), Robert Van Auken (8th PS) and James Selman (9th PS), the bulk of his remaining pilots had arrived in Australia virtually straight from flight school. Luckily for the 49th, the evacuation of the surviving pilots from the 17th PS (Prov) now provided Wurtsmith with a ready pool of Java veterans to draw on. At least 12 of the latter joined the pursuit group at this time, with most of them being appointed flight leaders. A number of them (namely Nate Blanton, Walter Coss, Jack Dale, Bill Hennon, Ben Irvin, George Kiser, Joe Kruzel and Al Strauss) had also seen action in the Philippines.

Despite Wurtsmith pressing for his unit to be deployed to Darwin as a full group, in early March it was felt necessary to rush a fighter detachment to Horn Island, at the top of Cape York off the north Queensland coast. The island's airfield was being used as a dispersal for Allied bombers in the area, and the USAAC deemed that it was vital to preserve it as an operating base. Wurtsmith gave the assignment to Capt Bob Morrissey on March 4, and he was told to select 12 pilots from the 7th PS for the trip



The RAAF's Advanced Operating Base at Horn Island, at the top of Cape York off the north Queensland coast, boasted virtually no facilities when the 7th PS detachment was sent here on March 9, 1942. The unit was fortunate to get advance warning of the incoming Japanese raid five days later, allowing pilots to get all nine Warhawks aloft before the airfield was bombed and strafed. (Author)

north. This was prior to the return of the Java veterans, so Morrissey had to choose 11 relatively inexperienced pilots to accompany him.

Just nine P-40Es eventually arrived at Horn Island on March 9. As a forward operating base, it boasted little in the way of facilities. The rushed detachment bore all the hallmarks of a disaster waiting to happen, for there were no groundcrew on hand to service the fighters, no way of protecting the Warhawks on the open airfield and no radar available to warn pilots of incoming raids. Without the latter, all Morrissey could do was instigate a daily routine of two defensive patrols, with his pilots forbidden from flying beyond visual range of the airfield.

On March 14 the IJNAF made its first attack on Horn Island, the raid being undertaken by a mix of fighters and bombers (eight "Bettys" accompanied by 12 A6M2s) from the recently formed 4th Kokutai, based at Lae in New Guinea. Fortunately for Morrissey, this formation was seen by a spotting station on the south coast of Papua, and this gave him enough warning to get all of his fighters into the air. Just prior to take-off at 1145 hrs Morrissey gave the following orders to his inexperienced charges:

> Take off together. Stay together. Don't wander from your wingman. Take off to the northwest and make a left climbing turn at full power. Form up on me.

Things soon went awry when, on passing through 10,000ft, Morrissey ordered everyone to test fire their guns, only to discover that all bar one of his weapons had jammed. He was forced to land and get them cleared. By the time Morrissey rejoined his men at 1220 hrs, the "Bettys" had dropped their bombs with customary accuracy from 23,000ft on the airfield's limited facilities. An RAAF Hudson had also been destroyed. Morrissey subsequently reported what happened next:

> We had been flying around for about five minutes when I saw eight Japanese bombers at 12,000ft, 15 miles out to sea and flying back in the direction of New Guinea. To the rear of the tight formation of bombers, a lone fighter, which I presumed to be Japanese, was flying back and forth off the tails of the big airplanes. Keeping in mind that fighters accompanied the bombers, I jockeyed our formation to attack the eight airplanes. While

Capt (seen here as a colonel) Bob Morrissey led the Horn Island detachment in his capacity as CO of the 7th PS. Subsequently made CO of the 49th FG in January 1943, Morrissey was severely wounded (he lost a leg) during the invasion of the Philippines in October 1944 when the ship on which he was a passenger was bombed. (NARA)

I was looking around to size up the situation, and just before I attacked, nine Zero fighters came into view also at approximately 12,000ft, but some 7000ft below us. I turned to attack the fighters.

At that time I had only three two-ship elements in the formation. The Japanese fighters were flying a close "V" made up of four three-ship "Vs." I decided to attack the leading Japanese element and let my second and third elements attack the consecutive Japanese ones. I proceeded to attack with my wingman, Lt A. T. House. My second element hesitated momentarily because the attack signal was not received clearly, and as I passed the second Japanese element they began shooting at me. Lt House saw what was happening and shot one Zero down, but at this point his guns jammed so he flew directly across the top of another Zero fighter and deliberately dipped his wing into the Jap's cockpit. The Japanese fighter [flown by FPO1c Oishi Genkichi] crashed, but Lt House, despite the loss of approximately three feet of his right wing, made a safe landing.

I shot one Zero [flown by Lt Iwasaki Nobuhiro] in the first element, but dove out without attacking another because I saw bullets being fired at me from behind. I didn't see the fighter that I shot go down, but knew he had taken enough of my 0.50-cal bullets to destroy him. Lt House later verified this with the statement that he saw the ship dismantle in mid-air immediately after my pass at him.

2Lt Harvey Martin, having disregarded Morrissey's orders, had gone after the bombers on his own. He managed hits on a "Betty" flying at the extreme edge of the G4M formation as he expended all of his ammunition, prior to diving back down to base. At least four of the Warhawks were subsequently damaged by the Zero-sens, and one by one their pilots broke off to land – their opponents assumed that these P-40s had been mortally damaged, and subsequently claimed six shot down and two probables.

The 7th PS had, however, more than held its own, and the American pilots celebrated the first kills for their squadron and group upon returning to Horn Island. These feelings were tempered by the non-appearance of 2Lt Clarence Sanford, who was posted missing. Much later it was discovered that Sanford had become disorientated after his aircraft was hit, and he eventually parachuted to safety in a coastal area some 400 miles west of Horn Island. Fortunate to be found and cared for by local Aborigines, Sanford was eventually returned to the US.

With only a handful of aircraft left undamaged following this action, Morrissey was ordered to withdraw his squadron south. This proved to be a wise decision, for three "Bettys" and 15 Zero-sens attacked Horn Island once again on March 18.

During the 7th PS's short foray to Horn Island, the 9th PS became the first unit from the 49th PG to deploy to Darwin. Capt Selman had led off a squadron-sized formation of 25 P-40Es from Williamtown on March 6, and ten aircraft dropped out along the way for various reasons. This left just 15 fighters to arrive at Daly Waters amid thunderstorms on the 14th, with one of the P-40Es being flown by Lt Richard Taylor. He described his new surroundings as follows:

Lt Col Paul Wurtsmith, CO of the 49th PG/FG, impressed upon his pilots the fundamental importance of maintaining formation during combat. The main challenge faced by the group during the early months of 1942 was a lack of experienced aviators. Four-aircraft flights of two pairs were used, with the flight leaders usually being veterans from the Philippines and/or Java. The tactic initially employed by the group was to climb as fast as possible in the direction of the bombers. During the course of the campaign, however, "dive and zoom" tactics were found to give the heavier P-40E a distinct speed advantage over the lightweight A6M2 when diving. If used effectively, these revised tactics largely negated the Zero-sen's superior maneuverability.

> Daly Waters, I remember, as almost the end of the earth. It was a small collection of tin-roofed shacks with the most incredible collection of flies, I think, anywhere in the world.

Selman subsequently led his first 13 P-40Es to bombed-out RAAF Darwin on March 18. However, with the field being too exposed to enemy attacks, the unit would conduct most of its early operations from Batchelor, 40 miles to the south. Advance flights would operate from Darwin, however, and also Adelaide River, not far from Batchelor. By the end of the month 21 P-40Es had arrived, and these were regularly flying four-aircraft patrols over Darwin. The fighter cover was sorely needed, as the IJNAF was now targeting the town with increasing frequency.

On March 16, just two days before the arrival of the 9th PS, a force of 14 G4Ms from the Takao Kokutai had dropped 168 60kg bombs on RAAF Darwin from 18,000ft. This raid had been unescorted, as was another three days later by seven

A 7th FS/49th FG Warhawk in a dispersal area at one of the airfields built just south of Darwin in early 1942. Natural tree cover was intentionally left close to the operating areas to provide concealment in conjunction with camouflage netting. These measures proved highly successful, resulting in very few aircraft being lost on the ground to enemy attacks. (Michael Claringbould)

"Bettys" that targeted the port. Only minor damage was inflicted during both attacks, and the appearance of unescorted bombers demonstrated that the IJNAF expected to encounter no fighter opposition over Darwin.

However, the Japanese would soon encounter serious opposition. The nature of the deployment of the 49th PG to Darwin would not be a recap of the rushed Horn Island episode, but rather an operation backed by significant resources. Already, both Australian and newly arrived American engineering units were busy constructing new airfields to the south of Darwin. By March work was under way on three new sites at the 27-Mile, 32-Mile (named Hughes) and 34-Mile markers from Darwin along the north-south Stuart Highway. Both 27-Mile and 34-Mile were earmarked for use by the 49th PG.

As the experience in Java demonstrated, a defensive fighter screen needed an efficient air warning network (preferably including radar) integrated with a ground control organization to vector fighters to predicted intercept points. An early RAAF radar set had been present in Darwin for some weeks, located at Dripstone Caves on the coast not far from RAAF Darwin. Although this was still being calibrated to function accurately in the local conditions when the 9th PS arrived, it was deemed to be just about operational. In the absence of reliable radar coverage, Darwin was largely dependent on visual sightings radioed from coastwatchers positioned on Bathurst Island to the north of the town. Additional radar stations were eventually added around Darwin during the course of 1942, with the best site being at Cape Fourcroy, again on Bathurst Island, although it was not operational until much later in the year.

Since late February, the RAAF's No. 5 Fighter Sector had been providing aircraft with ground control from tents near Darwin airfield. It would be responsible for sending the position of enemy plots to patrolling fighters, and, if necessary, giving instructions on interception tracks and related tactics. The 49th PG had in fact arrived in Australia with its own ground control unit in the form of the 49th Interceptor Control Squadron. When the 9th PS moved north this unit was still undergoing classified training in Brisbane, and it was not expected to join the 49th PG in Darwin until the second half of April.

Selman's squadron did not have to wait long to see its first action. On March 21 a C5M from the 3rd Kokutai flew a deep inland reconnaissance mission to Katherine,

A C5M2 "Babs" two-seat reconnaissance aircraft of the Tainan Kokutai – the aircraft bears the unit's "V" tailcode prefix on its rudder. "Babs" were often used by both the Tainan and 3rd Kokutais to undertake long-range reconnaissance missions of potential targets in northern Australia. They also led Zero-sens on long over-water flights, the second crewman acting as a specialist navigator and radio/camera operator on such missions. (Author)

This aerial photograph of Darwin was taken in March 1942 by a C5M "Babs" of the 3rd Kokutai. RAAF Darwin can be clearly seen in the bottom left corner of the image. By then it had already been largely destroyed during the raid on February 19, 1942. Nevertheless, it was repeatedly targeted by IJNAF G4M units for the rest of the year. (Australian War Memorial)

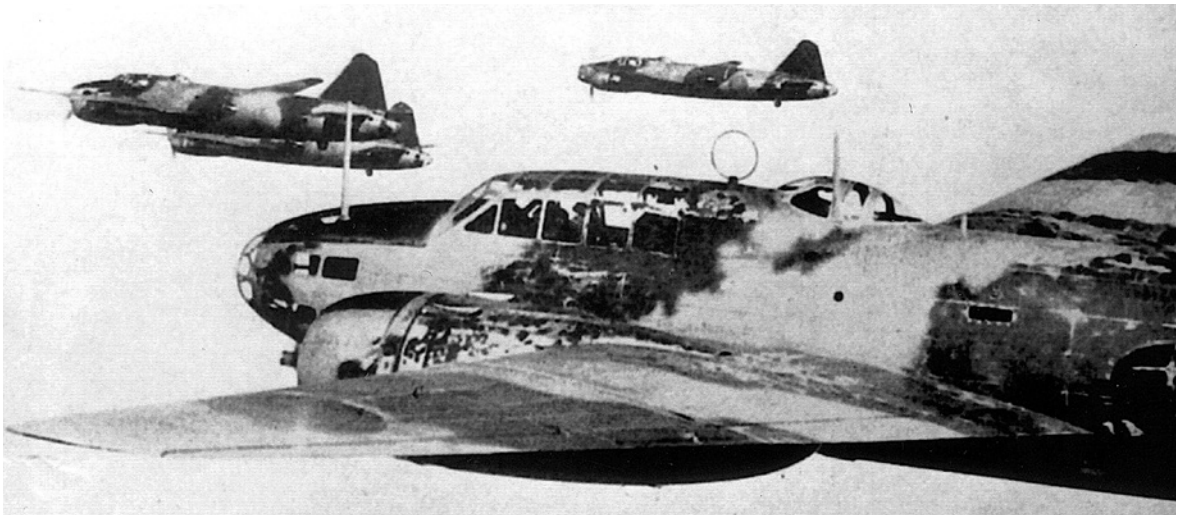
well to the south of Darwin. This particular flight completed its mission undetected by the newly bolstered air defenses. It was a different matter the following day, however, when another "Babs" (escorted by three Zero-sens from the 3rd Kokutai) overflew Darwin between 1000 and 1030 hrs. March 22nd also saw No. 31 Radio Direction Finding Station finally become fully operational at Dripstone Caves, and details of the intruders were relayed to four patrolling P-40Es that were flying at 20,000ft over the sea just north of Darwin.

Having taken the required photographs, the "Babs" turned northwards for its return flight at 19,000ft. It was at this point in the mission that the Zero-sen pilots broke off their escort and descended to strafe Darwin's civil airport at Parap. The C5M flew straight at 2Lts Clyde Harvey and Stephen Poleschuk, who were presented with relatively easy shots during their firing passes. The "Babs" went down in flames and crashed into the sea just west of Bathurst Island.

Shortly after this incident another plot was picked up by the radar station, but it could not be intercepted due to its distance from Darwin. This was a formation of nine "Bettys" that flew inland and dropped 90 60kg bombs on the airfield at Katherine, 180 miles south of Darwin. It became the southernmost target attacked during the 1942–43 bombing campaign against northern Australia.

Five days later on March 28, another unescorted raid by seven G4Ms from the Takao Kokutai was sent to attack RAAF Darwin – it seems that the IJNAF was still unaware that defending fighters were now operating over the area. Soon after 1400 hrs the "Bettys" released their pattern of 60kg bombs accurately over the target, further cratering the runway. Several 9th PS pilots had only been warned of the impending raid minutes before the G4Ms arrived overhead, and they were busy scrambling when the first bombs started to fall. 2Lt Mitchell Zawisza later recalled:

> Just as I got over the edge of the field I happened to look down and all I saw was dirt flying in all directions – the bombs had already hit. This proved to be enough of a



Takao Kokutai G4M1 bombers en route to Darwin in 1942. Aircraft from this unit were regularly engaged by P-40Es from the 49th PG/FG, with at least ten "Bettys" being shot down by Warhawk pilots. A low-grade primer was used by Mitsubishi when preparing its G4Ms for painting at the factory prior to delivery to the IJNAF, and this in turn caused the green element of the bombers' camouflage scheme to readily wear off in the hot, tropical conditions encountered in the NEI. (Bob Alford)

warning for me, so I headed south, southwest for about five minutes, full throttle, hedge-hopping and keeping over dark areas of foliage.

As the "Bettys" turned for home, their customary tactic was to enter into a slight descent so as to gain speed as they flew away from the target area. Having just avoided being bombed on take-off, Zawisza was able to join up with three other Warhawks and pursue the G4Ms out to sea. They subsequently made a number of uncoordinated attacks on the "Bettys," which responded with mutually supporting defensive fire from a tight echelon formation. The P-40Es ultimately chased the bombers some 100 miles out to sea, the engagement being a hard-fought one that saw the "Betty" gunners firing 7,782 rounds in their defense. Just the one G4M was downed, although all of the remaining six bombers sustained some damage.

Two days later, on March 30, the first combat between the 49th PG and Zero-sens near Darwin occurred. Seven Takao Kokutai "Bettys" had again been sortied on a raid against the town, although this time the aircraft had 12 A6M2s from the 3rd Kokutai as their escorts. Led by Lt Takeo Kurasawa, the fighters arrived over Darwin in the mid-afternoon at 16,000ft as the bombers targeted the RAAF base once more. Again, the 9th PS was late to receive warning of the attack, and several P-40 pilots found themselves pursuing the bombers out to sea while trying to climb as fast as possible. For the veteran aviators in their Zero-sens, this presented an easy opportunity. Swooping down, they shot up three Warhawks flown by relatively inexperienced pilots, one of whom, 2Lt Robert McComsey, was forced to bail out over Darwin harbor.

During the early afternoon of March 31 the IJNAF hit RAAF Darwin once more, with seven "Bettys" bombing the fuel dump with great accuracy. The resulting blaze soon blanketed the area in thick black smoke. The G4Ms were escorted by eight Zero-sens from the 3rd Kokutai, the fighters being led by Lt Toshitada Kawazoe. The flight of five P-40s led aloft by 2Lt Andy Reynolds was the only formation to make contact with the enemy. A veteran of Java, Reynolds had shared in the destruction of a "Messerschmitt 110" (actually a G3M) during his ferry flight to the NEI on February 6.

He had subsequently claimed three Zero-sens destroyed while flying with the 17th PS (Prov) in Java.

Reynolds' flight had only reached 7,000ft when the bombs began hitting the RAAF base below them. They were soon set upon by Zero-sens from above, and after a brief dogfight the Americans wisely dived away to safety. Reynolds duly claimed one of his attackers shot down, although on this occasion no losses were suffered by either side.

The pattern of Darwin's air raids continued into April. Just after 1500 hrs on the 2nd seven "Bettys" bombed central Darwin, damaging buildings and a Shell fuel depot. Flying at 22,000ft, these were escorted by just three Zero-sens. Althrough several Warhawks from the 9th PS were scrambled, this time they were unable to make contact with the enemy.

A veteran of combat over Java with the 17th PS (Prov) prior to joining the 9th PS/49th PG, 2Lt Andy Reynolds claimed seven Zero-sens destroyed between February 13 and July 30, 1942. His final victory tally was 9.333. (Michael Claringbould)

Two days later, on April 4, six "Bettys" approached Darwin at 22,000ft to bomb the RAAF base and nearby civil airfield at Parap. The G4Ms were escorted by six Zero-sens, and they arrived over Darwin shortly before 1400 hrs. The intruders had been detected by radar, and a reasonable amount of warning was given to eight P-40s that had taken off to fly a regular defensive patrol at 1230 hrs. These fighters were again led by 2Lt Andy Reynolds, who broke the formation down into two three-aircraft flights (one pilot, future ace 2Lt John Landers, was forced to fly alone when another aviator had to return to base with a mechanical fault) with instructions to climb to 26,000ft.

As the raiders neared Darwin, a shotai of three Zero-sens descended to low level in order to strafe the RAAF base, leaving just three fighters to protect the "Bettys." The bombers were spotted by Reynolds, who had an altitude advantage of 4,000ft with the sun behind him – a perfect position from which to attack. Reynolds led the first three P-40s in a diving pass and succeeded in targeting a "Betty" on the outer left side of the formation before the three A6M2s could react. Reynolds left the bomber smoking, and it was finished off by his wingmen, 2Lts John Sauber and J. Kelting – the "Betty" plummeted earthward in flames.

The second three-aircraft flight was led by 2Lt Grover Gardner, who, having not climbed as quickly as the lead formation, was forced to attack the G4Ms from below. Gardner, followed by his wingmen 2Lts James Watkins (also a future ace) and John Livingstone, succeeded in flaming a second "Betty" just after the formation dropped their bombs, inflicting minor damage on Parap. Gardner reported:

> At this time, they were dropping their bombs. The bomber I attacked burst into flames and I started shooting at the next bomber in line from the left. All this time ack-ack was firing and shells were bursting all around me. Right after the last bomber burst into flames, leaving three in formation, my plane was hit (I believe by ack-ack fire). From then on I was out of the fight and saw no more.

The Zero-sens now intervened and attacked the P-40s, with Reynolds' flight soon diving away, low on fuel and ammunition. Gardner's flight, however, was hit hard. Gardner, himself, was forced to bail out of his damaged aircraft and was rescued. Livingstone was wounded, and on trying to make an emergency landing at 34-Mile was killed when his P-40 crashed. While the American aviators reported being hit by "friendly" antiaircraft fire, it is more likely they were struck by defensive fire from the "Bettys" (whose gunners recorded firing 8,210 rounds) and typically accurate shooting by the Zero-sen pilots.

In an engagement where there was much confusion, the 9th PS believed it had wiped out the entire bomber formation. This was not far from the truth, with three "Bettys" being shot down and the remaining three all returning to Timor with varying degrees of damage and seven wounded crewmen. The wreckage of two of the bombers was recovered, including the aircraft with the tail-code T-361. A third bomber crashed into the ocean. It is possible that one of the G4Ms was downed by antiaircraft fire. Twenty-two crewmen were killed in the three "Bettys."

The 9th PS had scored a significant victory, albeit with the loss of Livingstone, who was the first member of the 49th PG to be killed in combat. Wurtsmith was soon to send a letter to Fifth Air Force (formed from what had been the FEAF on February 5, 1942) headquarters in Melbourne requesting that 34-Mile be renamed "Livingstone Field." This was approved, with the new name coming into effect from April 21.

The Japanese were quick to repeat their effort, with seven "Bettys" again attacking RAAF Darwin on April 5. These bombers had a stronger escort of 12 Zero-sens led by future ace Lt Sada-o Yamaguchi. On this occasion the combat situation did not suit the defenders, and the scrambled P-40s failed to intercept any of the IJNAF aircraft.

By April Darwin's sixth-month wet season had largely ended, and it was expected that better weather would see increased IJNAF activity. To this end, the 9th PS had already started occupying 34-Mile just prior to Livingstone's death. The other elements of the 49th PG were also *en route* to Darwin at this time, with many of the groundcrew and much equipment being involved in lengthy overland journeys by road and rail. The P-40s of the 7th and 8th PSs reached the Darwin area in mid-April, with the former being based at Batchelor while the latter went to Adelaide River – it would soon move into the newly completed 27-Mile airstrip, however.

2Lt John Livingstone of the 9th PS was killed while trying to make an emergency landing at 34-Mile on April 4 after being wounded in combat with Zero-sens from the 3rd Kokutai. He was the first pilot from the 49th PG to lose his life in action, and the 34-Mile airstrip was subsequently named in his honor. (Michael Claringbould)

Wurtsmith was quick to recognize the fundamental importance of the air raid warning system that had

recently been established, and he assigned the experienced Capt Van Auken the position of group Operations Officer. It was his job to oversee all ground control and warning activities going forward. Capt Allison Strauss took over Van Auken's previous role as CO of the 8th PS. Strauss was a veteran pursuit pilot who had served in the Philippines from late 1940 until he was evacuated to Australia, where he became a P-40 instructor at Amberley.

Meanwhile, Van Auken was quick to overhaul the fighter-control organization, setting up a grid system of ten-mile square sectors. The 8th PS was given responsibility for an area over the sea to the north of Darwin where several kills had already been claimed. The 9th PS was set to patrol over Darwin itself, while the 7th PS would mount patrols over the Cox Peninsula to the west of Darwin. By dividing the airspace in this way, Van Auken was assuming that the slow-climbing Warhawks would not be able to intercept the raiders until after they had dropped their bombs and commenced their flights home.

Another tactic proposed by Van Auken and approved by Wurtsmith was the full scramble. On news of an incoming raid, all available aircraft would be put into the air. This left no reserves to deal with a potential second raid, but events would prove that Van Auken and Wurtsmith were correct to adopt this tactic.

Tasked with assuming full maintenance duties for the 49th PG's hardworking Warhawks, some 300 men of the 43rd Material Squadron were now also making their way north. They would soon establish themselves at a permanent base near Batchelor, this unit proving instrumental in achieving high levels of reliability for the P-40's Allison engines and 0.50-cal guns.

The 49th PG's principal opponents, the 3rd and Takao Kokutais, were flying from the newly captured Penfui airfield near Koepang, in Timor. This was 500 miles from Darwin – comfortably within the Zero-sen's operating radius. To date, most of the Darwin raids had been made by just a single chutai of "Bettys," typically comprising six to nine aircraft. This was because only 18 of the G4Ms had initially been flown into Penfui in mid-March. Two more chutai were based in Luzon and were regularly bombing American units at Corregidor and Bataan. On April 9 the latter was finally captured, and this allowed the two chutai in the Philippines to be concentrated with the remainder of the Takao Kokutai at Penfui.

RAAF Hudsons of Nos. 2 and 13 Sqns had been regularly conducting bombing raids against Penfui during March and April, typically targeting the airfield at night. The Hudsons could only achieve the range required to hit this target by carrying a relatively modest bombload and by occasionally using Drysdale Mission, in Western Australia, as a forward base. The RAAF pilots knew Penfui well, having used the airfield regularly prior to its capture in February, and on occasion the raids caused significant damage to IJNAF aircraft. For this reason, both the Takao and 3rd Kokutais would soon withdraw to Kendari, leaving Penfui as a forward operating base only. However, just prior to this move a maximum strength effort was planned against Darwin on April 25 – Anzac Day.

On the morning of the 25th an impressive three chutai-strong formation of 27 "Bettys" departed Penfui, although three soon returned to base with engine problems, leaving 24 bombers to make the flight. To date, the Japanese had only been engaged by the 9th PS over Darwin, which meant that just a single chutai of nine

PO3c Kunimori Nakakariya had initially seen action over China with the 12th Kokutai in the spring and summer of 1941, claiming a handful of victories in long-range missions that took full advantage of the A6M2's unrivaled endurance. Transferring to the 3rd Kokutai in September of that same year, he participated in more long-range operations over the Philippines and the NEI prior to taking part in the opening attacks on Darwin. When part of the 3rd Kokutai moved to Rabaul in the fall of 1942, Nakakariya continued to fly missions over northern Australia with a small detachment from Koepang. Returning to Japan to instruct in May 1943, he later fought in the defense of the Philippines and Okinawa. Nakakariya survived the war with 16 victories to his name. (Yasuho Izawa)

Lt Takahide Aioi flew with the highly successful 12th Kokutai in China from 1937 through to 1939, claiming at least four victories in the A5M fighter. He joined the 3rd Kokutai as hikotaicho in February 1942 and subsequently led it on numerous missions over northern Australia until he was posted with much of the 3rd to Rabaul in September of that same year. Seeing more action over Darwin with the 202nd Kokutai in 1943, Aioi had been officially credited with ten victories by war's end. (Yasuho Izawa)

Zero-sens had been tasked with escorting the bombers. The fighters were led by China war veteran and ace Lt Takahide Aioi, who had recently taken over command of the 3rd Kokutai from Yokoyama.

The 49th PG received plenty of warning of imminent enemy activity thanks to the detection of unusually heavy radio activity. For the first time, all three squadrons in the group were placed on alert. Then, at around 1400 hrs, a large radar plot was detected in the vicinity of Bathurst Island. Immediately, the 7th and 8th PSs were scrambled, as were a small number of fighters from the 9th PS – a patrol from this unit was already aloft. This plot was the "Betty" formation flying at 26,000ft and gradually descending to 24,000ft on approach to Darwin in order to make a north–south bomb run over the RAAF base.

Flying a standing patrol just north of Darwin were seven 9th PS pilots led by 1Lt George Manning. They had taken off at 1230 hrs and acquired the enemy formation visually, no doubt helped by antiaircraft shells exploding just below the Japanese aircraft as they neared the target area. The "Bettys" dropped their bombs before the Warhawks were able to attack, however, and inflicted modest damage on the ground. Two US Army officers were killed when the command car they were driving through the target area suffered a direct hit.

Lt Aioi had spotted the slow-climbing P-40s stalking the G4Ms, and as the Warhawks got nearer the bomber formation the Zero-sens went after them. Several 9th PS pilots suddenly found themselves under attack, and soon dived away to safety. These fighters had no fuel for sustained combat maneuvers in any case and were soon landing. No aircraft were lost by either side, but this engagement had the effect of drawing the A6M2s away from the Bettys. No doubt based on the 3rd Kokutai's earlier experiences, Aioi did not expect to encounter any further fighters. However, some 36 P-40s of the 7th and 8th PS were already aloft, with the latter unit scrambling first. Most of these pilots were relatively inexperienced, and this would prove to be their first combat mission. Indeed, few of them had even had the opportunity to familiarize themselves with their new surroundings. The 8th PS was divided into two eight-aircraft flights, led by 1Lts Ed Sims and James Morehead. 2Lt Clyde Barnett had only about 25 flying hours in a P-40 as he climbed to intercept the "Bettys," and he later recalled making contact with the enemy:

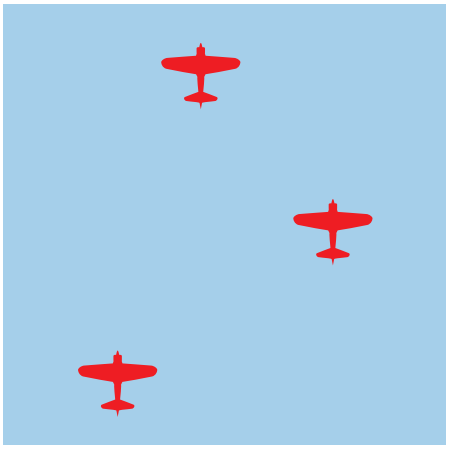
> I was really stretching my neck trying to look in all directions at once when I heard Morehead's voice calling his flight very calm and distinct just like in practice: "Enemy bombers 'three o'clock high.'" Looking to my right, I could see a smudge of a large formation a good way off and just slightly higher than we were. We were flying on a course to intercept them. We were at about 18,000ft at that time.

Morehead led the attack with his flight, the USAAC pilots being aided by the fact the "Bettys" had lost altitude to gain speed after dropping their bombs. Clearly believing all the danger was behind them, the G4Ms had descended below 16,000ft by the time the Warhawks attacked – a height at which the P-40s still had a reasonable performance. The 16 fighters from the 8th PS ripped into the bomber formation, with most of the pilots achieving hits on their selected targets. One "Betty" trailed flames and smoke from its starboard engine before the wing detached

and the bomber tumbled into the sea. Within minutes another three G4Ms had been downed.

1Lt Sims, in his first combat, led his flight into attack at 1424 hrs:

> About 24 bombers with Japanese markings were in the formation. I saw two bombers falling before I reached the formation. I hit one bomber, setting afire the left engine and splintering the tail assembly. The rear gunner seemed to have only vertical movement. The attack was made from the rear quarter. I engaged no enemy fighters. Landed my plane at Bathurst Island at about 1545. My ship was hit, damaging the oil tank and some oil was lost.



The 3rd Kokutai's Zero-sens used the standard IJNAF three-aircraft shotai, arranged in an echeloned V formation. Although an obsolete formation by European standards, the naval aviators made it highly functional by virtue of their exceptional teamwork and keen situational awareness. Usually flying without radios, pilots were keenly aware of the location and combat situation of the other two members of their shotai. When combined with the exceptional maneuverability of the Zero-sen, these tactics proved formidable for any adversary during the early stages of the Pacific War. An Allied fighter pilot who managed to get an A6M2 in his gunsight would typically find himself quickly targeted by the remaining two members of the shotai.

Before the 7th PS could attack the bombers, the Zero-sens finally intervened, and many running dogfights took place as the ragged "Betty" formation made its way home. The leading flight of the 7th PS, under the leadership of Java ace 2Lt Bill Hennon, was approaching the area when it came upon a single A6M2 that had become detached from the rest of the chutai. Spotting the approaching quartet of Warhawks, FPO1c Shiro Murakami fired from long range and then turned away. Hennon gave chase and attacked:

> I followed the Zero, whose belly tank was still on. He exploded. I was so close that the various parts of the destroyed plane struck my ship but caused little damage. I saw the Zero falling in six or seven pieces, all in flames. The main section struck the water and burned for a time.

Hennon had just claimed his sixth victory, three of them Zero-sens. This was one of the last combats fought by the P-40s on April 25 as many of the USAAC fighters were now short of both ammunition and fuel. A lack of the latter posed particular problems for pilots from the 8th PS as they were far out to sea and most had had no chance to familiarize themselves with the Darwin area. A number of aviators put down at airfields that were not their own, with the most distant being 2Lt Edward Miller (victor over two G4Ms), who mistakenly flew to Western Australia and landed at Drysdale Mission.

That evening the American pilots toasted their success. They had suffered no losses. Just three Warhawks had been damaged, including the fighter flown by 2Lt Sims which he landed on Bathurst Island. The Americans eventually settled on claims of ten bombers and three Zero-sens destroyed, although in reality they had downed four "Bettys" (with the loss of 32 crew) and Murakami's single A6M2. In addition, most of the remaining bombers had been damaged to some extent, with three having to return on just one engine. One of these ditched, as did another "Betty" that had aborted earlier with technical difficulties, bringing total bomber losses to six. Overall, it had been an astounding victory for the 49th PG.

However, the Takao Kokutai was keen to demonstrate it was not a spent force, and because of the recently arrived aircraft from the Philippines it was able to target Darwin again just two days later. On this mission, 16 "Bettys" were provided with an increased escort of 21 Zero-sens (a portent of IJNAF fighter operations to come) led

by Lt Takeo Kurasawa. Unlike on Anzac Day, Japanese radio discipline was sound during this mission and there was no advance warning of the impending raid. This meant that it was only detected by radar at a distance of 80 miles, which did not give enough time for the scrambled Warhawk pilots to reach the altitude of the bombers at around 20,000ft. At 1135 hrs 186 60kg bombs were dropped on RAAF Darwin, doing damage to buildings and killing four Australian airmen.

Once again, an impressive total of some 50 Warhawks got airborne, but only about half of these were able to make contact with the enemy formation as it retired westwards across Darwin harbor. The first flights to arrive were from the 8th PS, led by unit CO Capt Allison Strauss. One of his wingmen was 2Lt Earl R. Kingsley, who later wrote the following combat report:

> Capt Strauss led his flight – myself and Lt Alford – to the right of the enemy just before they dropped their bombs, and misjudged their speed and distance to the extent that we went in just behind the bomber formation. When I saw that Capt Strauss had misjudged the leading formation, and was turning in behind the bombers, and that the Zeros on his tail were also in a position to fire, Lt Alford and I both turned into them hoping to at least scare them off. Capt Strauss saw the Zeros, pumped the stick a couple of times, then turned right into a very tight turn. The Zeros started firing.
>
> I, having missed the bombers, also turned to assist Capt Strauss, and a second Zero cut in front of me, apparently trying to cut off Capt Strauss from the front. I shot him in the belly and he went down. The first Zero was then shooting, and tracers were just missing Capt Strauss' tail. A Zero, according to Lt Alford, came down from behind and high to the left and was firing on my tail from directly behind. I dove to 17,000ft and chandelled to the left, as the bombers turned to the left. I climbed parallel to their course and on the left side of them until, well above them, I made one pass at a Zero and three bursts at the bombers. Two were hit in the middle of the fuselage without apparent damage. There were six Zeros with the bombers and I left them.

Capt Strauss apparently fell to the guns of the Zero-sen on his tail and crashed to his death near Darwin harbor. Outnumbered and attacked from above, the 8th PS was badly mauled by the 3rd Kokutai. 2Lt C. C. Johnson, with 2Lt Otis Fish as his wingman, made a head-on pass at an A6M2, but found himself under attack from behind. He was able to break hard and dive away, but Fish apparently took fatal hits from the Zero-sen and his P-40 crashed into the water. 2Lt Harvey Martin's Warhawk was also badly shot up by a Japanese fighter and he ditched just off the Cox Peninsula.

Further west, several fighters managed to reach the "Bettys," and one of these was shot down. Another USAAC pilot, 2Lt Stephen Andrew of the 7th PS, was forced to bail out after his Warhawk was hit in a head-on pass with a Zero-sen. Overall, it had been a keenly contested engagement, with the "Bettys" firing 8,181 rounds in self-defense and the Zero-sens almost 4,000 rounds of both 20mm and 7.7mm ordnance. Two A6M2s were damaged, although none were lost, as against the destruction of four P-40s and two pilots killed for the 49th PG. The newly completed 27-Mile airstrip was named Strauss Field in honor of the fallen squadron commander.

Following the April 27 raid, the Takao Kokutai and the bulk of the 3rd Kokutai were withdrawn to Kendari to avoid them being targeted by RAAF Hudsons. This left

just one chutai of Zero-sens at Penfui for forward defense duties. The Takao Kokutai would spend the next few weeks rebuilding its strength after the losses suffered in April. Just a single raid by nine "Bettys" was attempted in mid-May, but the mission was aborted due to bad weather over the Timor Sea.

Earlier that same month both the Takao and the 3rd Kokutais were held in readiness to possibly support operations in the New Guinea theater aimed at capturing Port Moresby. Following the Battle of the Coral Sea (May 4–8), the invasion operation was postponed, and fighting in the New Guinea theater remained separate from the bombing campaign against Darwin.

After an interval of some six weeks, the IJNAF planned a multi-day blitz on Darwin for mid-June. The first raid, on June 13, was the biggest yet staged by the Takao Kokutai on Darwin, and it was comprised of three full chutai of 27 "Bettys." They were escorted by a large force from the 3rd Kokutai numbering 45 Zero-sens from four chutai, the fighters being led by Lt Takahide Aioi. This would be the biggest single raid on Darwin after the February 19 carrier attack. The "Bettys" would now bomb from as high as was practicable – generally around 26,000ft. Most of the escorts would be higher still, which was at or exceeding the maximum ceiling of the P-40s in tropical conditions.

Even from high altitude the G4M bombing was accurate, hitting the RAAF base once again and cratering its runways. On this occasion a standing patrol of eight Warhawks from the recently redesignated 8th FS (during May the USAAF designation "pursuit" had been changed to "fighter," hence the 49th PG became the 49th FG and its three pursuit squadrons became fighter squadrons) was directed against the enemy formation. Also included were two P-40s flying an exercise with antiaircraft batteries. The pair comprised the experienced Maj Van Auken and 2Lt Ben Brown. The ten P-40s were directed to climb towards the enemy formation, but whilst doing so they were set upon by swarms of Zero-sens from above. Hopelessly outnumbered, several of the American machines were hit, one of them flown by Van Auken. He later recalled:

> Made an attack [on the bombers] from the left rear after evading two Zeros which attempted to head me off. Fired a burst into one bomber and dove away, coming up about three miles on the other side of the formation. When attempting to get into position for another attack, I was surprised by an attack by Zeros, who put 20mm "slugs" in my wing. I dived and pulled out at 10,000ft. Could not pull out with the stick, so was forced to use the stabilizers. At this point I was again attacked and received more hits. I believe this was the same pair of Zeros that first attacked. I went into another dive and pulled out at 300ft. I looked back and saw that the enemy was still on my tail. They shot at me again and my airplane caught fire. I opened the canopy and unfastened my belt, preparing to bail out. I pulled up to 800ft and slow rolled, intending to drop out at the top. When a quarter of the way around, with my wings vertical, the ship seemed to be hit with a torrent of bullets and went out of control completely, starting to drop. This threw me back into the cockpit. I put my arms and head into the slipstream, which pulled me out of the airplane. I immediately pulled the ripcord. One of the Zeros fired a burst at me while I was descending in the parachute. This was the last attack.

A flight of four 9th FS/49th FG P-40Es close up for a photograph during a patrol in June 1942. The lead aircraft – *"Bicky"* – was assigned to Capt Joe Kruzel, a veteran of combat in both the Philippines and Java (where he claimed two Zero-sens destroyed) and a future ace. (Michael Claringbould)

Van Auken landed in shallow water 150ft from shore. 2Lt Pierre Alford also bailed out of his damaged machine, and 2Lt Earl Kingsley fired on a Zero-sen that attempted to shoot up the downed pilot while he hung beneath his parachute. Kingsley duly made the sole claim (for a victory) by the 49th FG in this action. In fact, two Zero-sens had been lost, one or both possibly ditching during the return flight to Timor. The pilots involved were FPO1c Katsuji Matsushima and SEA1c Mikio Tanikawa. Five "Bettys" were damaged, probably as a result of antiaircraft fire – 118 3.7-in. rounds were fired at the attackers.

The following day, the Japanese tried a change of tactics, with a fighter sweep of Darwin by 27 Zero-sens led by Lt Tadatsune Tokaji. Only two flights of P-40s were able to engage the IJNAF fighters as they descended through medium altitude over Darwin harbor. While the Americans claimed four victories, no Zero-sens were in fact lost. In exchange, just the P-40 flown by 2Lt Keith Brown of the 7th FS was downed – a vast improvement on the five Warhawks lost the previous day. The inexperienced Brown was fortunate to survive bailing out of his blazing aircraft with severe burns and a broken femur.

The maximum force effort continued on June 15 with a raid by 27 "Bettys," although this time with a lesser-sized escort force of 21 Zero-sens led by Lt Takeo Kurasawa. On this occasion the G4Ms targeted the wharf area and nearby oil tank farm, with a number of bombs also detonating throughout the town center. Four people were killed on the ground. Some 28 P-40s got into the air and climbed as fast as possible to try and get at the bombers. In yet another change of tactics, the 21 escorts flew in front of the "Bettys" and engaged the Warhawks in a large-scale running dogfight to the west of Darwin. Several of the P-40s made it through to the bombers, and 11 "Bettys" recorded some degree of damage, but all made it back to base.

In the fighter-versus-fighter actions, the 3rd Kokutai once again had the upper hand after attacking from above and concentrating its numbers against isolated flights of Warhawks. Two P-40s were shot down, with 2Lts Claude Burtnette and Clarence Johnson managing to bail out. Both were rescued, although not before Johnson had spent five days lost in dense mangroves on the Cox Peninsula.

Remarkably, the Japanese continued their "blitz" the very next day. Once again, 27 "Bettys" arrived over Darwin escorted by an identical number of Zero-sens led by 3rd Kokutai CO Lt Takahide Aioi. The G4Ms released their bombs at 1128 hrs, causing damage to commercial buildings and another oil tank farm. In a repeat of the action the previous day, 18 Warhawks from the 8th and 9th FSs struggled to reach the altitude of the enemy formation as it raced away from Darwin. The 8th FS was then hit hard from above by a superior number of A6M2s. Philippine veteran 1Lt Randall Keator (who had claimed two Zero-sens destroyed on December 8, 1941) described the loss of his wingman, 2Lt Chester Namola, as follows:

> We started in to attack and before reaching the bomber formation three Zeros dropped their belly tanks. We could not get to the bombers, so we dived away from them, and that is when I lost my wingman.

Namola was hit in the first pass and likely disappeared into Darwin harbor – no trace of him or his aircraft have ever been found. Fellow 8th FS pilots 2Lts William Harris and Harvey Martin made forced landings after their aircraft were damaged during combat, the latter ditching in shallow water just off a beach at Cox Peninsula.

The 9th FS caught the Japanese formation further west over the Cox Peninsula, by which time the "Bettys" had descended somewhat to 21,000ft. This allowed some of the American pilots to fire on the bombers, nine of which were damaged. The G4M gunners fired 648 20mm rounds and 6,020 7.7mm rounds in self-defense. The Zero-sens were also able to intervene effectively, forcing another three P-40s to make emergency landings south of Darwin after being hit. The IJNAF suffered no losses on this day.

The 49th FG had experienced four straights days of combat against greater number of Zero-sens, and the feelings of the pilots involved were summarised by group historians Ferguson and Pascalis as follows:

> The 49er pilots all expressed frustration with their attempted interceptions at the extreme limit of the Warhawk's altitude capability. The Ops Execs, particularly Capt Hennon of the 7th FS, admonished the inexperienced pilots who chose to attempt individual combat with the Zero at high altitude. All the veterans advised any pilot to use the "hit-and-run" tactic whenever possible.

Part of the reason for the IJNAF offensive against Darwin was to ensure it could not be used as a base to attack the NEI. However, despite the constant raids, RAAF Hudsons continued to regularly target Timor and they also ventured as far north as Ambon on one occasion. The Hudsons were joined on these attacks by B-17 Flying Fortresses from the 19th Bombardment Group in May and June, with the USAAF heavy bombers targeting the key Japanese airfield at Kendari in late June.

A combat-weary Hudson of the RAAF's No. 2 Sqn prepares to be loaded with a mix of 100lb and 500lb bombs by suitably attired groundcrew at Batchelor. The Hudsons were the main offensive strength of the Allied air forces in the Darwin region in 1942, and they often targeted G4Ms and A6M2s flying from their former base of Penfui, in Timor. (Australian War Memorial)

Further Darwin raids had been launched on June 17 and July 23 by forces of nine and 23 "Bettys" respectively, but on both occasions the bombers were forced to return to base in the face of bad weather. A variation in tactics then followed, with six night raids being flown against Darwin during the last week of July. Where possible, these were engaged by searchlights and 3.7-in. antiaircraft fire. 1Lt pilot James Morehead took off during one of these raids in an attempt to intercept the bombers. Effectively blinded by the glowing exhaust stubs of his Allison engine, Morehead was left to fly gentle orbits until sunrise, when he landed. As the RAAF would later demonstrate, the P-40E could indeed be used as a nightfighter following specialized pilot training.

The first daylight raid in six weeks occurred on July 30. This time 26 "Bettys" targeted RAAF Darwin, where they inflicted modest damage. The bombers were escorted by 27 Zero-sens led by Lt Takeo Kurusawa. Improvements in the radar network enabled the raiders to be detected 160 miles from Darwin, which was just enough time to permit the P-40s to climb to the same altitude of the bombers.

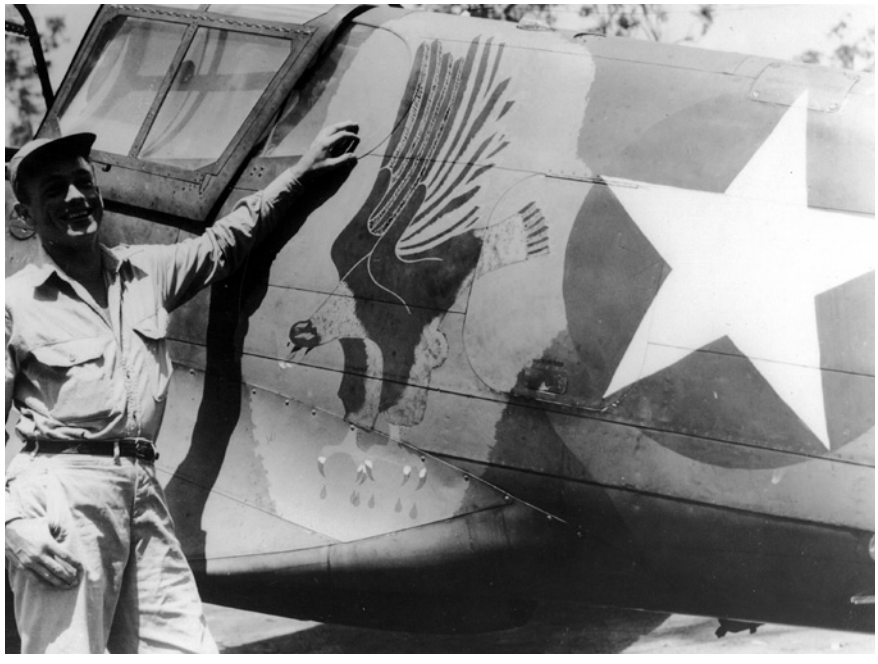
Some 36 P-40s were scrambled, and the main contact was by 11 Warhawks from the 7th FS – the unit's fighters were split into three flights, one of which was led by the CO, Capt Bob Morrissey. The combat reportedly lasted only 90 seconds, as the American pilots were committed to employing "hit and run" tactics. When the Zero-sens targeted them during their attack approach, they dived away, with two P-40s being damaged. Flying as "tail end Charlie" in one of these flights was 2Lt George Drake, who made the fatal error of pressing home his attack run on the bombers. His fighter was shot up by two Zero-sens and he was forced to bail out. Subsequently, flights from the 9th FS under the leadership of experienced pilots 1Lts Andy Reynolds and Clyde Harvey were also able to make "hit and run" passes at the bombers.

For the loss of Drake's aircraft, the 49th FG believed it had scored a significant victory over the IJNAF when its pilots claimed three "Bettys" and six Zero-sens

ENGAGING THE ENEMY

On August 23, 1942 a large aerial engagement took place when 27 G4M "Bettys" of the Takao Kokutai, escorted by a full three chutai of 27 A6M2 Zero-sens from the 3rd Kokutai, targeted Hughes airfield to the south of Darwin. These aircraft were engaged by several flights of P-40Es from the 49th FG's 7th and 8th FS both on their way to and from the target.

Using "dive and zoom" tactics, the USAAF pilots succeeded in breaking up the usually tight escort formations. Over the ocean to the west of Darwin, some of the scattered Zero-sens were caught by Warhawk pilots, whose excellent gunnery produced the best results for the USAAF during the entire 1942 campaign in the defense of Australia – four A6M2s were downed without loss, although one P-40 pilot made an emergency landing after running out of fuel. This would prove to be the last time that the Warhawk and Zero-sen clashed over Darwin. Within weeks the 49th FG had handed over local defensive duties to the RAAF, prior to heading to New Guinea.



2Lt Andy Reynolds stands next to artwork of a swooping eagle (or perhaps it is a hawk) with bloody talons applied to his P-40E. This emblem adorned at least two 9th FS Warhawks during the summer of 1942. Many of the group's P-40Es received elaborate, and large, fuselage decorations (as well as nose art and nicknames), principally because of the lack of other recreation activities on offer to hardworking groundcrew based at airstrips miles from Darwin. (Michael Claringbould)

destroyed. However, the only Japanese aircraft that failed to return to base was the A6M2 of FPO1c Shigeru Mukomoto.

Three more weeks passed before the next raid, on August 23. This was another maximum strength effort, with 27 "Bettys" sent aloft. This time they targeted Hughes airfield to the south of Darwin, where No. 13 Sqn was based with its Hudsons. The G4Ms were escorted by three full chutai of Zero-sens, comprising 27 machines led by Lt Tadatsune Tokaji. Once again, ample radar warning was received, enabling a number of P-40 flights to scramble and reach the intruders as they approached at 25,000ft. These Warhawks joined several others that were already aloft and at altitude because of an earlier false alarm. This time the Japanese formation flew past Darwin to the west, giving the American pilots additional time to intercept the bombers. Nevertheless, only 16 of the 36 P-40s that were in the air would make contact with the enemy.

Capt Kiser led a flight of three P-40s from the 8th FS that attacked the lead G4Ms head-on over the Cox Peninsula. Next, a flight of four 7th FS Warhawks led by 1Lt Ray Melikian made their own passes, followed by an 8th FS trio led by 1Lt Clarence Johnson. During these attacks one "Betty" was shot down in flames and another had engine shot out. Trailing smoke, the bomber was protected by Zero-sens as it turned around and limped back to Dili airfield in Timor, where it crash-landed. Meanwhile, the remaining G4Ms fought their way through to the target, with two more receiving serious damage in the process. Once again, the bombing accuracy was very good even when the "Bettys" were under attack. Damage was inflicted on base infrastructure at Hughes, where two RAAF aircraft (a Wirraway and a Buffalo) were also destroyed.

As the individual P-40 flights finished their attacks, they dived away at speed before regaining altitude to make further passes. With the flights working independently of one another, the Zero-sens were often wrong-footed. For example, after reacting to

one attack, which saw the Warhawks diving away at speed following a single firing pass at the bombers, the IJNAF fighter pilots were then vulnerable to being bounced as they slowly climbed back up to the G4Ms in order to resume protecting them. Taking full advantage of this situation, 49th FG pilots employed improved gunnery to achieve the best results yet for the P-40E against the Zero-sen. Four of the latter were shot down. Among the successful pilots was ace 1Lt Jim Morehead, who, along with wingman 2Lt Earl Kingsley, was able to surprise a shotai of Zero-sens from above. Morehead, who was credited with two victories, described what happened next:

> At 100 yards I put the crosshairs on the canopy of the right-hand plane in the formation and pulled the trigger. Six 0.50-cal machine guns roared without a stutter and the canopy of the fighter seemed to melt. I held the trigger down until I saw that the plane was shattered.

Among those killed were two very experienced aviators in the form of buntaicho Lt Tadatsune Tokaji and FPO2c Nobutoshi Furukawa, a 1939 flight school graduate. The remaining two pilots killed, FPO2c Itsuzu Shimizu and FPO3c Yoshiyuki Hirata, were relative novices, having graduated from flight school in early 1942. The 49th suffered no losses, although one pilot ran out of fuel and made an emergency landing. It was a highly successful action for the group, even if the actual tally of one "Betty" and four Zero-sens destroyed was far less than the 15 victories credited to its pilots.

The August 23 raid would be the last time the 49th FG and the 3rd Kokutai clashed over Darwin in 1942. Indeed, both units would soon be heavily involved above the skies of New Guinea and the Solomon Islands. In September the job of defending Darwin was handed over to the RAAF's Nos. 76 and 77 Sqns, which were also equipped with P-40Es. They would have to contend with regular night raids by the Takao Kokutai, and in November Sqn Ldr Dick Cresswell made a successful night interception and downed a "Betty."

Capt Ed Kiser of the 8th FS/49th FG poses with the lion artwork that adorned his P-40E. A veteran of combat over the Philippines (where he claimed two Zero-sens destroyed on December 10, 1941), Kiser briefly commanded the 17th PS (Prov) PS on Java after the loss of three commanding officers in a short space of time. An ace by the time he was evacuated to Australia, Kiser then joined the 8th PS and claimed three "Bettys" and a Zero-sen destroyed while defending Darwin. (Michael Claringbould)

STATISTICS AND ANALYSIS

It is hard to draw meaningful conclusions from the brief aerial campaign over Java in February 1942, such was the difficult fighting environment in which the 17th PS (Prov) found itself. In the handful of fighter combats that took place, the Zero-sen pilots certainly emerged victorious, with around 17 Warhawks being downed versus just three A6M2s (despite USAAC pilots claiming considerably more) – a ratio of almost six-to-one. However, this campaign was more significant for the lessons learned by the surviving American P-40 pilots. It was a dangerous business trying to intercept high-flying bombers in the slow-climbing Warhawk when the "Bettys" and "Nells" were shielded by an escort of well-flown Zero-sens. Ideally, a good warning system was necessary to achieve an altitude advantage prior to attacking the incoming bombers.

Over Darwin, the results were much more evenly matched. Excluding the Warhawks that made emergency landings after combat and were salvaged, 14 P-40s were downed by Zero-sens in aerial combat for the loss of eight A6M2s. However, some of these aircraft may have been brought down by antiaircraft fire and/or bomber gunners. Also, it is slightly misleading only to compare the fighter-versus-fighter scores, as most of the American pilots saw attacking bombers as their primary duty in the defense of Darwin. Given that the 49th PG/FG also downed at least one "Babs" and ten "Bettys," when these are added to the tally of Zero-sens destroyed the actual air-to-air kill ratio favors the Warhawk pilots.

For the group to achieve such a ratio during the early stages of its wartime operations was highly laudable, although it should be noted that the bulk of the "Betty" kills

came in April when the 49th had surprised the IJNAF firstly with the presence of the 9th PS in Darwin and, a short time later, with all three of its squadrons.

Nevertheless, the 49th's increased effectiveness as the campaign came to an end in late August 1942 is shown by its widespread employment of "dive and zoom" tactics. The latter, which negated the height advantage previously enjoyed by the Zero-sen units, was facilitated by better radar warning coverage over northern Australia. The Warhawk squadrons were now being scrambled far earlier, allowing pilots to climb above the approaching raiders.

Another statistic of interest is the fact that just four Warhawk pilots – Livingstone, Strauss, Fish and Namola – lost their lives in combat over Darwin (several others were killed in accidents). This is testimony to the sturdy construction of the Warhawk, and also the fact that the 49th was fighting over friendly territory. Pilots that bailed out or crash-landed were usually rescued in quick order. The following year, some 16 Spitfire pilots of the RAAF's No. 1 Fighter Wing would lose their lives fighting the same opponent over Darwin. This was despite the fact that the Spitfire VC had excellent high-altitude performance – admittedly, the aircraft had some very significant mechanical and armament problems, however.

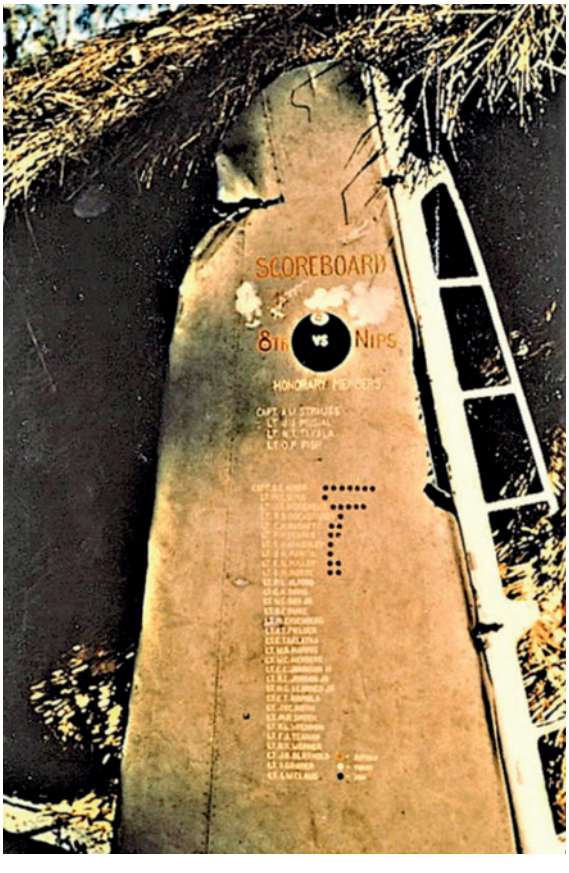
One reason for the relative success of the 49th PG/FG was Lt Col Wurtsmith's tactic of allowing each of his squadrons to use their own initiative and attack independently, or even as isolated flights. In conventional military theory of the period, such tactics were usually derided as attacking in "penny packets" that in turn

Capt Bill Hennon (left) is congratulated by 1Lt James Morehead just after the "blitz" of mid-June, when Zero-sens appeared over Darwin on four consecutive days. Both men were by then aces, and they would be credited with four A6M2s and three "Bettys" destroyed between them in the defense of Darwin. Prior to joining the 49th PG, they had both survived considerable action over eastern Java, where they had also claimed a handful of victories. Although Morehead survived the war, Hennon was killed in a flying accident off Long Island on March 31, 1943. (Michael Claringbould)

allowed the defending fighter escorts to concentrate their attention on overwhelming the smaller formations as they attempted to engage the bombers. However, over Darwin, this tactic was successful. In responding to each attack, the Zero-sen pilots had to expend altitude diving on approaching Warhawks, and they never knew precisely how many attackers they were facing. Hence the 3rd Kokutai inadvertently left the bombers open to attack on several occasions.

The following year the Spitfires of No. 1 Fighter Wing stuck to "Big Wing" tactics, whereby three squadrons would form up as a whole wing prior to attacking. While potentially powerful, this had the effect of telegraphing to the Zero-sen pilots exactly where the interception would come from as the large formation was easily seen. In the bright tropical sunlight, it was harder to spot small formations of fighters, and thus the 49th PG/FG tactic of attacking independently in smaller formations was far more successful. Another factor against "Big Wing" tactics was fuel, as neither the P-40 or the Spitfire enjoyed largesse in their endurance. Forming up an entire wing, from three different airfields, took both time and precious fuel, leaving fighters short of the latter when it came to actual combat.

What exactly did the IJNAF achieve during its raids on Darwin during 1942? Commentators have often noted that the results were modest, even though the bombing was usually accurate. For example, RAAF Darwin was often targeted, but few Allied aircraft were destroyed as they were now relatively safely dispersed at the newly constructed and well camouflaged airfields to the south of the town. However, the very fact that the Japanese could mount daylight raids meant that no large ships could use Darwin harbor. Arguably, in this way the bombing campaign denied Darwin as a launching pad for a large-scale Allied offensive into the NEI. While Darwin received supplies via small ships and an overland route, the quantity of materiel brought in by these means would never be enough to support any large offensive force.



The scoreboard used by the 8th FS (known as the "Eightballers") was a tailplane from the Zero-sen that crash-landed on Melville Island after the carrier raid on Darwin on February 19, 1942. Above the unit's pilot register are the names of four 8th FS aviators who lost their lives during this period, including Capt Allison Strauss and 2Lt Otis Fish, who were two of the four 49th FG pilots to be killed in combat over Darwin. The two other names are those of 2Lts John Musial and Neal Takala, who were killed during a training flight in New South Wales in March 1942. (Bob Alford)

Overall, the 49th PG/FG had done remarkably well over Darwin in 1942, even if its actual kills were far less than the 76 "confirmed aerial victories" claimed by the group. As a result, the 49th was the first American combat unit in the SWPA to be awarded a Presidential Unit Citation. However, when analyzing the campaign after the group's element of surprise during operations in March-April had gone, the 3rd Kokutai enjoyed the better victory ratio. Given that both opposing units shared traits of strong leadership, professionalism and operating efficiency, it is perhaps a fair outcome that neither achieved a clear victory. For the American pilots engaging in high-altitude aerial combat in an aircraft never designed as an interceptor against the rightfully lauded Zero-sen, this was an admirable outcome.

AFTERMATH

By the end of the dry season in 1942, it was clear that the main axis of the Japanese offensive in the Pacific was through New Guinea and the Solomons. Accordingly, the 49th FG was earmarked for service there. During August and September, the RAAF's P-40E-equipped Nos. 76 and 77 Sqns arrived in the Darwin area to take over defensive duties. These units remained until early 1943 when they were replaced by the Spitfire VC-equipped No. 1 Fighter Wing.

The first elements of the 49th FG arrived in Port Moresby in mid-September 1942. From this location, the Warhawks often served as fighter-bombers in support of ground troops. Among their variety of duties, they also escorted transport aircraft and bombers. During these missions American pilots routinely saw combat against Zero-sens and, from December, IJAAF Nakajima Ki-43 "Oscar" fighters. By 1943 the old P-40Es had been mostly replaced by more powerful P-40K/Ns and also P-38 Lightnings. Subsequently, the 49th FG would see considerably more aerial action over New Guinea and the Philippines, and in doing so become the highest-scoring fighter group in the USAAF – its pilots had been credited with 667 aerial victories by war's end.

After the departure of the 49th FG from Darwin, the 3rd Kokutai continued occasional operations over the town, mostly when escorting C5M reconnaissance aircraft. However, the 3rd was also drawn eastwards, with a sizeable contingent of 21 Zero-sens being transferred to Rabaul in September, from where pilots undertook combat missions as part of the Guadalcanal campaign. Over the course of two months the unit lost eight aircraft and six pilots in action. During this deployment the 3rd also flew some missions over New Guinea, where its pilots may have briefly reacquainted themselves with the 49th FG.

By early 1943 the 3rd Kokutai had been renumbered the 202nd Kokutai, and it would again see repeated action over Darwin during the dry season of that year

Sqn Ldr Dick Cresswell, CO of the RAAF's No. 77 Sqn, shows off multinational artwork applied to his P-40E (probably for propaganda purposes) at Livingstone in January 1943. Cresswell shot down a Takao Kokutai "Betty" during a night mission on November 22/23, 1942, RAAF P-40E squadrons having only recently taken over Darwin defense duties from the 49th FG. (Australian War Memorial)

against the Spitfire VCs of the RAAF's No. 1 Fighter Wing. While centrally based at Kendari, the 202nd also had defensive responsibilities over a wide area of the NEI following increasing attacks by USAAF B-24 Liberators based south of Darwin. In March 1944 the 202nd was withdrawn to the Central Pacific as the Japanese moved wholly onto the defensive. By July of that year the kokutai had been disbanded, although subsidiary units saw much service in the defense of the Philippines and later over Okinawa and Japan itself.

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P-40E cover art
On February 3, 1942, the Japanese launched a massive aerial assault on eastern Java with a combined force of more than 100 bombers escorted by Zero-sen fighters. Several newly arrived P-40E Warhawks of the 17th Pursuit Squadron (Provisional) climbed as fast as possible to try and reach the bomber formations over Soerabaja. The Warhawks were led by Philippine veteran 1Lt Walter Coss, who twice dived away after being attacked by Zero-sens from above. Coss had just turned back in the direction of the squadron's airfield at Ngoro when he fortuitously came upon a formation of A6M2s below him. He dived on the trailing machine and shot it down in flames, Coss's victim being FPO1c Kyoji Kobayashi of the Tainan Kokutai. This was the first victory claimed by a P-40E pilot over Java. (Cover artwork by Gareth Hector)

A6M2 cover art
All three squadrons of the 49th FG became operational in the defense of Darwin in April 1942, when they effectively surprised the incoming Japanese formations and enjoyed some success – particularly on April 25, when they downed four "Bettys" and a single Zero-sen. However, just two days later, the Japanese responded with another bombing raid that had a much stronger escort of 21 A6M2s from the 3rd Kokutai, the Zero-sens being led by Lt Takeo Kurusawa. This time the American pilots had less warning of the raid, and as the P-40Es labored to reach the height of the bombers they were badly mauled by Japanese fighters from above. Four P-40Es were lost and two pilots killed, including the popular commanding officer of the 8th Pursuit Squadron, Capt Allison Strauss. (Artwork by Gareth Hector)

Title Page
8th FS/49th FG ace 1Lt James Morehead demonstrates a fast take-off from Strauss Field in his P-40E 41-36171 *L'Ace* in May 1942. (Michael Claringbould)